

Department for Environment and Heritage

Management Plan



Mainland Conservation Parks of Yorke Peninsula

2009



Government
of South Australia

This plan of management was adopted on **24 June 2009** and was prepared pursuant to section 38 of the *National Parks and Wildlife Act 1972*.

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**Government
of South Australia**

Department for
Environment and Heritage

FOREWORD

The Yorke Peninsula includes some of South Australia's most iconic landscapes. Many people spend their holidays enjoying the beautiful environment and spectacular scenery and the Peninsula supports many thriving agricultural and tourism communities.

The region's beauty has been preserved in nine conservation parks located across the Peninsula. These parks, created from the 1970's through to 2008, cover more than 9,000 hectares, and help to conserve hundreds of native flora and fauna species. The parks also contain areas of great significance to the Narungga and Kurna people.

We can manage these precious areas best if we do so in a coordinated fashion – as a network of remnant vegetation and habitats that have important conservation values.

This Management Plan has therefore grouped all nine conservation parks into a single plan. This will enable management directions to be implemented at a landscape scale, and will provide consistency across all mainland conservation parks on the Yorke Peninsula.

The Plan will monitor natural revegetation of native vegetation, manage the health of significant wetlands and protect native fauna and habitat.

Many people have contributed to this Management Plan, and I gratefully acknowledge their interest and suggestions. Both the preparation and the implementation of the Plan will benefit from the partnerships formed between State and Local Government, boards and committees, conservation groups and local communities.

I now formally adopt this Management Plan for Mainland Conservation Parks of Yorke Peninsula under the provisions of section 38 of the *National Parks and Wildlife Act 1972*.

Jay Weatherill

HON JAY WEATHERILL MP

MINISTER FOR ENVIRONMENT AND CONSERVATION



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1 PARK LOCATION AND FEATURES

This management plan encompasses nine conservation parks that are located across the Yorke Peninsula, South Australia (Figure 1). The parks contribute to regional biodiversity through their variety of plant communities: mallee vegetation dominates inland, although due to variations in soil, rainfall and aspect, a variety of different plant associations occur. Coastal areas are dominated by dune-systems vegetation, samphire and mangroves. Although visitation to the reserves is low, these areas contribute to the natural and scenic value of the region. All coastal parks are proclaimed to low water mark¹.

Yorke Peninsula comprises a total area of approximately 4,265 square kilometres, which is contained within about 560 kilometres of coastline extending 240 kilometres from north to south. The surface topography is gently undulating, with an average elevation about 90 metres above sea level. The characteristic topography of the interior is subdued, with the more dramatic landscape and geographical features confined to the coast. Yorke Peninsula is characterised by long, hot, dry summers, and a winter rainfall season. The average daily maximum is around 22°C; occasionally in summer reaching 40°C. The average annual rainfall is around 500 millimetres on the central part of the peninsula, and approximately 330 to 400 millimetres near the coast; the wettest months being from May to September. Winds can be quite strong and variable along the Yorke coast.

Yorke Peninsula has been subjected to high levels of native vegetation clearance primarily for cultivation and grazing purposes. Most remnant native vegetation patches are situated along the coastline, with a large reasonably well connected remnant habitat in the southern-most area of the Yorke Peninsula that includes Innes National Park. Remnant vegetation is also found in isolated pockets in DEH reserves, private property and roadsides. Some of the subject parks are small, with environments quite modified from their pre-settlement condition. Nevertheless, given the paucity of natural vegetation on much of Yorke Peninsula, the contribution of the parks to biodiversity conservation is important, with many of them protecting flora and fauna species of conservation significance such as the nationally and state vulnerable Annual Candles (*Stackhousia annua*) and Malleefowl (*Leipoa ocellata*).

The parks are also of cultural significance for the Narungga and Kaurna people.

Bird Islands Conservation Park

Bird Islands Conservation Park (369 hectares; constituted by statute in 1972) is located at Warburto Point on Spencer Gulf, about 10 kilometres south of the town of Wallaroo. Land additions were made to the park in 1991 to include the intertidal zone of both islands and in 1999 to include the larger, mainland section, which supports mangroves and coastal fringe vegetation.

Carribie Conservation Park

Carribie Conservation Park (19.5 hectares; constituted by statute in 1972) is located beneath the 'toe' of Yorke Peninsula, about 7 kilometres inland from the coast, immediately east of Gleasons Landing and north-east of Daly Head. The park conserves a small area of remnant sheoak/mallee vegetation.

Clinton Conservation Park

Clinton Conservation Park (1,923 hectares; constituted by statute in 1972) is a boomerang-shaped reserve situated at the northern extremity of Gulf St Vincent. The park has had several land additions following its proclamation. This coastal park extends from north of the township of Port Clinton, around the western side and head of the gulf, to the town of Port Wakefield. It then runs south again along the eastern coast to Sandy Point. The park comprises an expanse of mainly low-lying, coastal-fringe habitats, with mangroves and samphire communities, and extensive tracts of intertidal mudflats. The head of gulf wetland and Wakefield River estuary are important as a fish nursery and a significant site for migratory wading birds.

¹ Property descriptions are provided in Appendix A. The other reserves on the peninsula - Innes National Park and Althorpe Islands, Goose Island and Troubridge Island Conservation Parks have separate management plans.

Leven Beach Conservation Park

Leven Beach Conservation Park (502 hectares; proclaimed in 1988) is a coastal reserve located on Hardwicke Bay, part of the northern coastline on the upper 'foot' of Yorke Peninsula. It has a six-kilometre beach frontage backed by low cliffs and a hinterland of undulating, vegetated dunes. Leven Beach Conservation Park conserves sheoak woodland and potentially provides habitat for a nationally endangered species of butterfly, the Yellowish Sedge-skipper Butterfly (*Hesperilla donnysa donnysa* form *flavescens*).

Minlacowie Conservation Park

Minlacowie Conservation Park (28.5 hectares; proclaimed in 2008) is located about 13 kilometres west of Stansbury. The park comprises a small patch of remnant mallee/broombush vegetation in very good condition, and conserves a number of significant plant species including the nationally and state vulnerable Winter Spider-orchid (*Caladenia brumalis*).

Point Davenport Conservation Park

Point Davenport Conservation Park (242 hectares; proclaimed in 1987) is located on a promontory that separates Foul Bay from Sturt Bay, mid-way along the southern coastline of Yorke Peninsula. It is an area of high biodiversity with a range of habitats including beaches and foredunes, and an estuary that is listed as a nationally important wetland. The park borders a swamp fringed by Paperbark Tea-trees (*Melaleuca halmaturorum*).

Ramsay Conservation Park

Ramsay Conservation Park (147.2 hectares; proclaimed in 2008) is a small park in the Minlaton-Curramulka Threatened Habitat Area. Its dominant vegetation is sheoak and mallee, with very low woodlands and a grassy understorey. It occurs in a high priority bioregion and conserves some species of conservation significance, including the nationally and state endangered Jumping-jack Wattle (*Acacia enterocarpa*), which has not been recorded thus far in any other National Parks and Wildlife Act reserves on Yorke Peninsula.

Warrenben Conservation Park

Warrenben Conservation Park is a large reserve (4,065 hectares; constituted by statute in 1972). Together with nearby Innes National Park, it conserves a substantial proportion of the natural habitat remaining on southern Yorke Peninsula. The park comprises an area of undulating limestone plains and low, stabilised dunes that remain well vegetated with mallee and tea-tree scrub and some sheoak woodlands. It provides habitat for a number of threatened species including the nationally and state vulnerable Annual Candles, state rare Goldsack's Leek-orchid (*Prasophyllum goldsackii*), and the nationally and state vulnerable Malleefowl and Western Whipbird (*Psophodes nigrogularis leucogaster*).

Wills Creek Conservation Park

Wills Creek Conservation Park (2,130 hectares; proclaimed in 2006) is situated at Mangrove Point on the north-western shores of Gulf St Vincent and is a significant coastal wetland/estuary area supporting mangroves and intertidal habitats. The park extends south from the township of Port Clinton to the town of Price. Wills Creek Conservation Park consists of mangrove and samphire habitats along the coastal fringe. Wills and Shag Creeks are known fish nursery areas and as an important habitat for seabirds. To the north, the mangrove woodland is somewhat atypical, being backed by eroding limestone cliffs topped with mallee and dryland tea-tree vegetation. Wills Creek Conservation Park is subject to active mining leases.

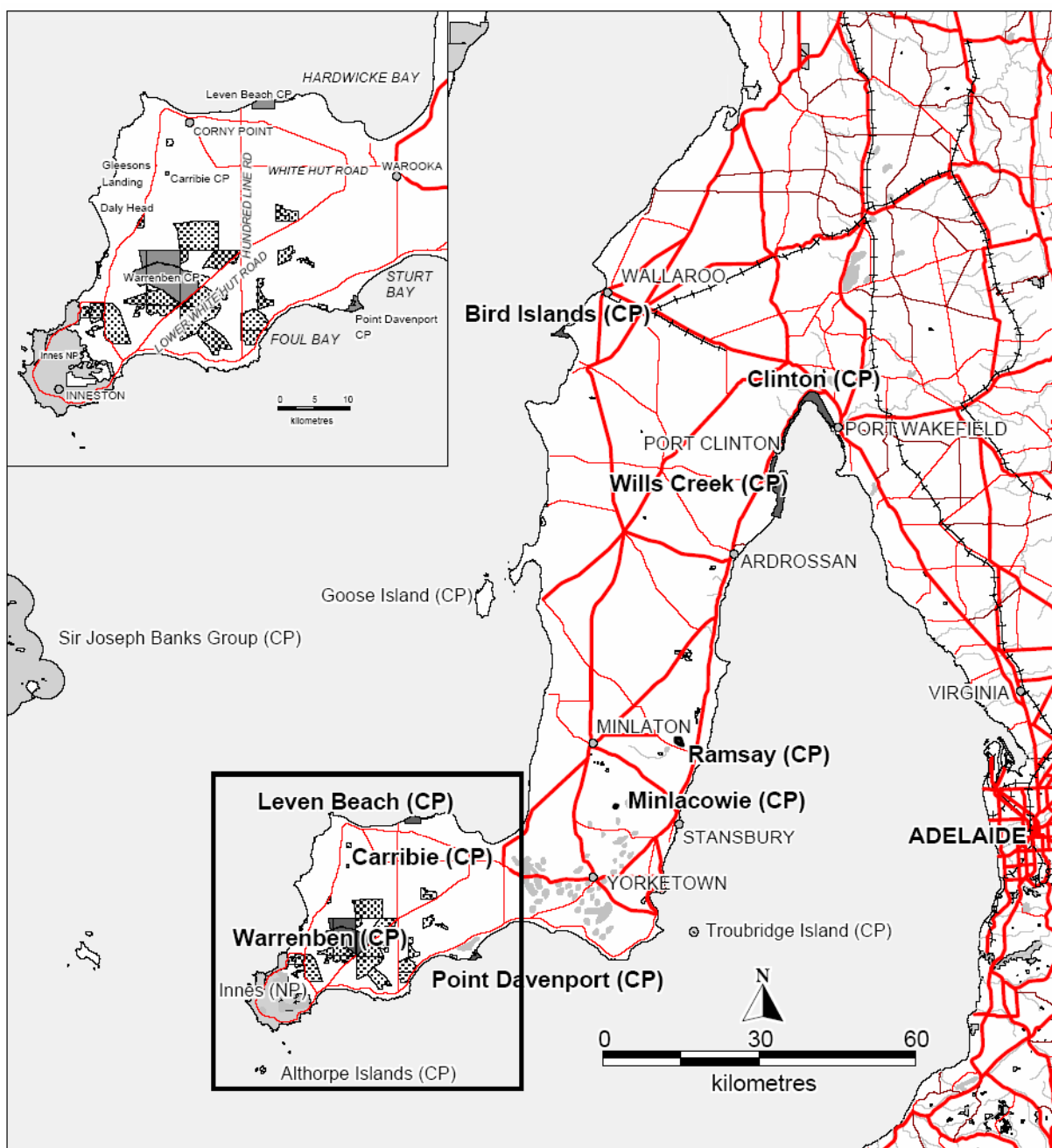


Figure 1

Mainland Conservation Parks of Yorke Peninsula

Location

LEGEND

■ Mainland Parks of Yorke Peninsula (CP)

■ Other DEH Reserves

▨ Heritage Agreements

(CP) Conservation Park
(NP) National Park

— Major & Minor Roads

● Towns

—+— Railways

— Drainage

Map designed and created by
Reserve Planning using PAMS
Projection: Longitude / Latitude (GDA 94)
Date: February 2007

This map is indicative and only
intended for the purposes of
this management plan

2 LEGISLATIVE FRAMEWORK

2.1 National Parks and Wildlife Act 1972

Reserves are managed by the Director of National Parks and Wildlife subject to any direction by the Minister for Environment and Conservation or the Chief Executive of the Department for Environment and Heritage (DEH). When managing reserves, the Director is required under section 37 of the *National Parks and Wildlife Act 1972* (the Act) to have regard to, and provide actions that are consistent with the following objectives of management stated in the Act:

- preservation and management of wildlife;
- preservation of historic sites, objects and structures of historic or scientific interest within reserves;
- preservation of features of geographical, natural or scenic interest;
- destruction of dangerous weeds and the eradication or control of noxious weeds and exotic plants;
- control of vermin and exotic animals;
- control and eradication of disease of animals and vegetation;
- prevention and suppression of bush fires and other hazards;
- encouragement of public use and enjoyment of reserves and education in, and a proper understanding and recognition of, their purpose and significance;
- generally, the promotion of the public interest; and
- preservation and protection of Aboriginal sites, features, objects and structures of spiritual or cultural significance within reserves.

Section 38 of the Act states that a management plan is required for each reserve. A management plan should set forth proposals in relation to the management and improvement of the reserve and the methods by which it is intended to accomplish the objectives of the Act in relation to that reserve.

DEH is responsible for preparing management plans and undertaking the prescribed community consultation process. A standard management planning process is mandated to ensure all statutory obligations are met. Help and guidance with plan preparation is sought and obtained from individuals, community groups and/or relevant advisory committees, although ultimately the decision on whether to adopt a management plan remains a ministerial prerogative.

In accordance with the Act, the provisions of a management plan must be carried out and no actions undertaken unless they are in accordance with this plan. In order to achieve this, each year park managers, taking regional and district priorities into account, draw up work programs to implement some of the strategies proposed in management plans. Implementation of these projects is determined by, and subject to, the availability of resources (eg staffing and funding).

2.2 Native Title Act 1993

Native Title describes the rights and interests Aboriginal and Torres Strait Islander People have in land and waters according to their traditional laws and customs. This management plan is released and has been adopted subject to any native title rights and interests that may continue to exist in relation to the land and/or waters. Before undertaking any acts that might affect native title, DEH will follow the relevant provisions of the *Native Title Act 1993*.

3 VISION

The vision for the Mainland Conservation Parks of Yorke Peninsula is to conserve a network of remnant vegetation and provide habitat for species of conservation significance, thus contributing to the conservation of regional biodiversity.

3.1 Key Values

- Protect important vegetation remnants including mainland mallee and coastal dune-systems vegetation, samphire and mangrove habitats.
- Protect two major estuaries/wetlands of national significance, which provide habitat for a variety of birds, including many waterbird species and migratory seabirds of conservation significance.
- Provide habitat for several flora species of conservation concern such as Annual Candles (*Stackhousia annua*) (AUS: V, SA: V) and the Winter Spider-orchid (*Caladenia brumalis*) (AUS: V, SA: V)¹.
- Provide habitat for several fauna species of conservation concern such as Malleefowl (*Leipoa ocellata*) (AUS: V, SA: V), Slender-billed Thornbill (*Acanthiza iredalei*) (AUS: V, SA: V) and Western Whipbird (*Psophodes nigrogularis leucogaster*) (AUS: V, SA: R).

3.2 Key Threats

- Pressures on pastures, grasslands and native vegetation through overgrazing by Western Grey Kangaroos (*Macropus fuliginosus*).
- Predation on native fauna by the introduced Red Fox (*Vulpes vulpes*) and Feral Cat (*Felis catus*).
- Introduced plants that compete with native floral species for space and resources.

3.3 Key Strategies

- Monitor natural regeneration (or undertake appropriate revegetation, particularly in the degraded areas of Clinton Conservation Park).
- Monitor health of significant wetland habitats in Clinton, Point Davenport and Wills Creek Conservation Parks.
- Identify and protect native fauna, primarily through the protection of native habitat (especially that of breeding sea birds). Take fauna habitat requirements into account when planning and undertaking species management or recovery plans, native vegetation rehabilitation or introduced plant control programs.
- Poison or remove introduced plant species in the highest biodiversity areas using minimal disturbance methods wherever possible.

¹ Appendix B provides a description of the conservation status codes used in this section.

4 ZONING

Section 39 of the *National Parks and Wildlife Act 1972* provides for the designation of zones in a reserve. Zoning aims to ensure that public use and management actions remain compatible with the protection of reserve values and constrains the use of land in zones to the conditions specified in an adopted management plan.

The management zones described below and shown in Figures 2, 3 and 4 establish a framework for the sustainable use of the parks during the life of this plan.

Lease Zone

This zone is designated over those portions of the parks that are currently held under lease (or licence). Terms and conditions of lease agreements vary, but public access can be subject to approval by lessees who take full responsibility for the designated areas and manage the associated assets. Development and building works may be permitted in a Lease Zone. Requiring the lessees to undertake actions to reduce threats to biodiversity and help restore natural ecological processes may also be a condition of a lease agreement. Conversely, licence conditions do not normally grant tenure to land.

Bird Islands Conservation Park has a Lease Zone for the wind anemometer currently owned under licence by the Bureau of Meteorology (Figure 2). There is one shack remaining at Sandy Point (Point Davenport Conservation Park) with a life tenancy to a fisherman (Figure 3). It is occupied under a leasing arrangement between the Department for Environment and Heritage and the tenant, and is designated as a Lease Zone. Wills Creek Conservation Park has a Lease Zone for the portion of land leased by Cheetham Salt Ltd, which manages and operates several salt pans (Figure 4).

Conservation Zone

The remainder of the parks are covered by the Conservation Zone. This zone has the primary management objective of conserving biodiversity values. The outcome is that public use will be restricted to activities deemed sustainable and compatible with the protection of natural and cultural values, and confined to areas considered safe for visitors. Activities with minimal environmental impact such as walking, interpretation and education, scientific research and nature appreciation will be permitted using existing tracks and trails within the zone. Vehicle access is permitted along designated roads and tracks only. No development will occur in this zone.

Marine Waters

Nineteen marine parks are proposed to be in place by 2010 (*South Australia's Strategic Plan*, Government of South Australia, 2007) and may be located in the vicinity of the conservation parks covered in this management plan. The marine parks will be established under the *Marine Parks Act 2007* to further the protection and maintenance of biological diversity and of natural and cultural resources. Most activities, including recreational and commercial activities, will still be allowed within marine parks; however, in order to protect representative habitats, species and ecological features, there will be zones where some activities will not be permitted. For Bird Islands, Leven Beach, Point Davenport and Wills Creek Conservation Parks, marine waters, typically to low water mark, are protected within the boundaries of each park.

The *Marine Parks Act 2007* and the *National Parks and Wildlife Act 1972* will be complementary in their goals and objectives. The interaction between National Parks and Wildlife Act reserves and marine parks, where the boundaries may overlap, will be supported by policies to ensure a complementary management framework. Until addressed on a case-by-case basis, management of any marine waters within conservation park boundaries will continue as per the provisions of the *National Parks and Wildlife Act 1972*.

Development Plans

The parks addressed by this management plan fall within the areas of four different Development Plans and lack consistent zoning as areas designated for conservation. All of the parks aside from Bird Islands Conservation Park are either entirely or partially within the Yorke Peninsula District Council area. It is recommended that Ramsey, Minlacowie, Point Davenport, Warrenben, Carribee and Leven Beach be changed to a conservation zone when the development plan is next revised.

Clinton Conservation Park crosses the boundary of Yorke Peninsula District Council and Wakefield District Council. Wakefield District Council does not have a specified conservation zone and instead allows for conservation through the objectives of the coastal zone. It is recommended that the Council considers the creation of a conservation zone and that this be applied to Clinton Conservation Park to ensure consistency across the development plans.

Bird Islands Conservation Park falls partly within the Land Not Within a Council Area (Coastal Waters), which does not specify a conservation zone, and the Copper Coast District Council as the coastal zone. When the Land Not Within a Council Area (Coastal Waters) Development Plan (administered by the Minister responsible for the *Development Act 1993*) and the Copper Coast District Council Development Plan are next revised, it is recommended zoning with the specific purpose of conservation be established and that Bird Islands Conservation Park be designated with this zoning.

Objective

Zone the Mainland Conservation Parks of Yorke Peninsula to ensure appropriate land use, landscape protection and the conservation of wildlife habitats and cultural features.

Strategies

- Designate and adopt the management zones as described in Section 4 Zoning and depicted in Figures 2, 3 and 4.
- Request that the parks be zoned specifically for the purpose of conservation when relevant Development Plans are next reviewed.

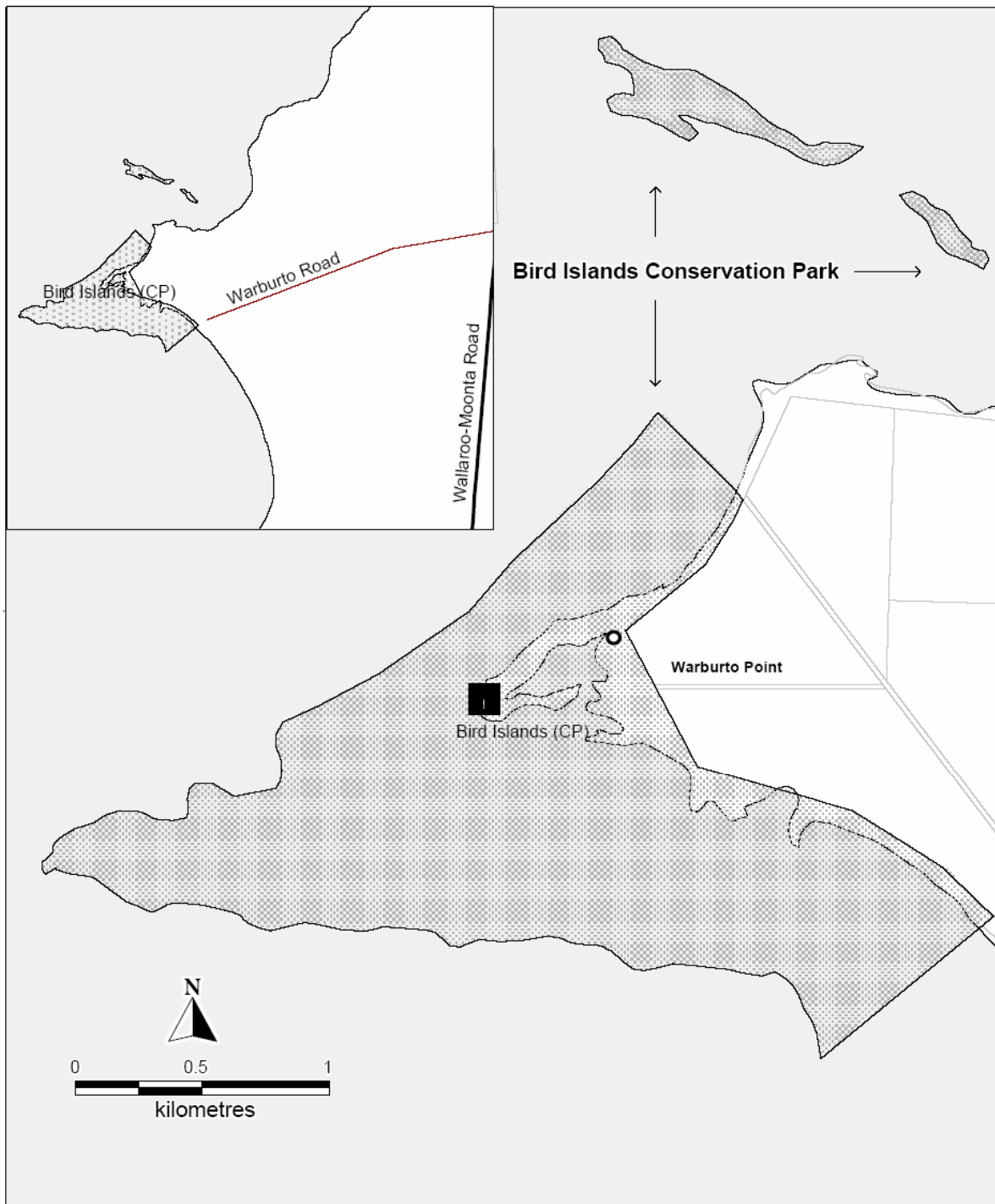








Figure 2

Bird Islands Conservation Park Features and Zoning

Map designed and created by
Reserve Planning using PAMS
Projection: MGA Zone 53 (GDA 94)
Date: March 2007

This map is indicative and only
intended for the purposes of this
management plan

LEGEND

- | | | | |
|---|--|---|----------------------|
|  | Conservation Zone |  | Major & Minor Roads |
|  | Lease Zone (Wind anemometer
owned by the Bureau of Meteorology) |  | Gate |
|  | Park Boundary |  | Land Parcel Boundary |

Note: The site designated for the wind anemometer lease zone is 3 metres squared

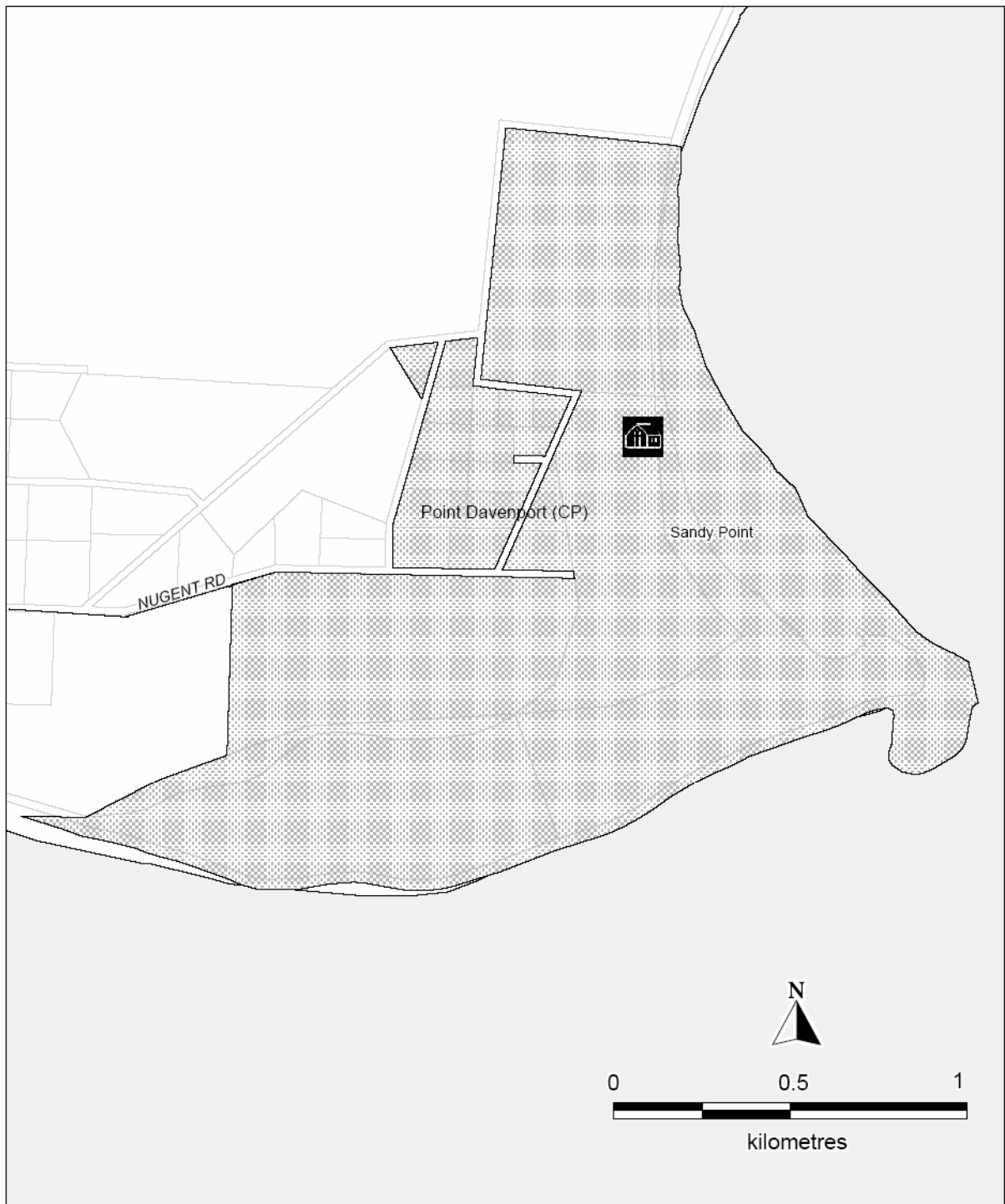


Figure 3

**Point Davenport Conservation Park
Features and Zoning**

Map designed and created by
Reserve Planning using PAMS
Projection: MGA Zone 53 (GDA 94)
Date: March, 2007

This map is indicative and only
intended for the purposes of this
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LEGEND


-  Lease Zone (Shack)
-  Conservation Zone
-  Park Boundary
-  Land Parcel Boundary



Figure 4







Wills Creek Conservation Park

Features and Zoning

Map designed and created by
Reserve Planning using PAMS
Projection: MGA Zone 54 (GDA 94)
Date: February 2007

This map is indicative and only
intended for the purposes of this
management plan

LEGEND

-  Lease Zone (Salt pans operated by Cheetham Salt Ltd.)
-  Conservation Zone
-  Park Boundary
-  Land Parcel Boundary
-  Major & Minor Roads
-  Towns

5 MANAGING NATURAL HERITAGE

5.1 Geology, Soils and Landform

Yorke Peninsula has gently undulating terrain that only reaches modest elevations (less than 200 metres). The basement rocks underlying the peninsula are around 500 million years old. Lime sediments and sands subsequently covered these rocks. From 235 to 200 million years ago, glaciers moved across from a south-easterly direction, flowing out over the sea covering what is now Yorke Peninsula. As they melted, deposition of boulders, sands and clay occurred on the sea floor (District Council of Yorke Peninsula, 2005). Clays deposited at that time now underlay the salt lakes of southern Yorke Peninsula. A period of elevation and erosion followed, but from 64 to 1.5 million years ago, the sea again inundated much of the area. Limestone and calcrete deposited during that period are now the most common types of surface rock encountered.

The parks that are the subject of this management plan mostly display shallow sands or loams that have developed on the limestone or calcrete crust. Those parks located near the coast also include aeolian sand dunes that formed over the last 10,000 years, now stabilised by native vegetation (Graham et al., 2001). The nature of these sandy soils is such that their long-term stability requires intact vegetation cover. In some situations, illegal off-road driving has resulted in a network of tracks being formed and localised damage to vegetation can be quite severe. This occurs at Bird Islands, Clinton, Leven Beach and Point Davenport Conservation Parks, and to a lesser extent, Warrenben Conservation Park. The resultant impacts are not only to the visual amenity; they can be so severe that the stability of the dunes or samphire flats is threatened. These activities are of serious concern and need to be regulated more effectively. Vehicle access should be controlled to prevent these areas becoming unstable and to reduce negative impacts on vegetation. This could be achieved through appropriate protection fencing, vehicle barriers and signage and enforcement of regulations.

Elevated salinity is inherent in the soil profiles of Yorke Peninsula (Northern and Yorke Natural Resources Management Board, 2008), and it is presumed that the native vegetation has evolved to cope with this. However, groundwater-driven salinity poses a greater threat in terms of overall impact on the environment (see Section 5.2 Hydrology).

Objective

Preserve the geology and soil structure integrity of the parks.

Strategies

- Identify existing areas of soil erosion or disturbance and undertake remedial works.
- Monitor visitor use of sand dune areas, particularly public vehicle access, and regulate access if stabilising vegetation and soil structure is threatened using measures such as signage, protective fencing and enforcement of regulations.
- Undertake biological remediation works using plants derived from local seed sources.

5.2 Hydrology

Given its topography, Yorke Peninsula has little drainage definition and most of the surface water catchments terminate in the land-locked, saline lakes that are a common feature of the landscape (Northern and Yorke Natural Resources Management Board, 2008). There are a number of different sub-surface aquifer systems, both shallow and deep. Shallow groundwater reserves occur in nine separate basins that are used as water sources, mainly for domestic livestock (Northern and Yorke Natural Resources Management Board, 2008). Of these, St. Vincent, Gawler Craton and Carribee Basins underlie the parks addressed by this management plan.

The coastal wetlands/estuaries within Clinton, Point Davenport and Wills Creek Conservation Parks are listed in the Directory of Important Wetlands in Australia as being nationally significant (Environment Australia, 2001). These three wetland areas are also identified in the Draft Estuaries Policy and Action Plan for South Australia (Department for Environment and Heritage, 2005c) as being either known estuaries: Wakefield River (ie Clinton Conservation Park); or estuaries requiring further investigation: Price River (ie Wills and Shag Creeks within Wills Creek Conservation Park) and Scott Creek (ie Point Davenport Conservation Park).

The general objective for park managers should be to maintain natural water volumes and flow patterns, which will involve integrating park management with that of the surrounding catchment areas located beyond the parks' boundaries. This can be achieved through liaison with local authorities as part of the natural resource management process.

While primary or elevated soil salinity typifies much of Yorke Peninsula, most salinity is secondary and has been caused or exacerbated by land and water management practices introduced with European settlement. The hydrological effects on natural habitats are not well understood, although it is recognised that groundwater salinity on Yorke Peninsula is high and levels are rising. While it would appear that increasing salinity is not likely to pose immediate problems on the subject parks, there have been some impacts on native vegetation elsewhere on the peninsula. There may therefore be value in supporting the investigation and monitoring of trends in the underlying groundwater aquifers as an aid to future management decision-making. Park managers should establish contact with the Northern and Yorke Natural Resources Management (NRM) Board, the Department for Water, Land and Biodiversity Conservation (DWLBC) and relevant authorities such as local councils, with regard to the broader catchment, groundwater quality, sustainability and salinity management issues.

Park managers should take the required steps to maintain a healthy wetland/estuary. The Draft Estuaries Policy and Action Plan for South Australia (Department for Environment and Heritage, 2005c) lists desired outcomes and a number of principles that are intended to assist estuary managers. Some on-park activities, such as 4WD access, appear to be degrading the fringes of the intertidal zone and could be impacting on tidal creek systems. Access considerations should not be allowed to interfere with tidal flows.

Specific hydrological considerations for some of the parks follow:

Clinton Conservation Park

Clinton Conservation Park includes a major wetland/estuary of national significance. It is classified in the Directory of Important Wetlands as comprising Marine and Coastal Zone Wetlands types A1, A2, A6, A7, A8 and A9 (Environment Australia, 2001). The criteria for listing were:

1. It is a good example of a wetland type occurring within a biogeographic region.
2. The wetland supports native plant or animal taxa or communities, which are considered endangered or vulnerable at a national level.

In wet years, freshwater outflows emanate from the Wakefield River and its diversion channel. Activities occurring in the wider catchment area may have the potential to influence the volumes and quality of fresh water entering the head of the gulf. The area around the river mouth itself is within the Port Wakefield township area and not part of the park, but hydrological impacts can spread more widely. For example, large floods have impacted on drainage systems in the park causing increased siltation, which can impact on the soil and vegetation of the park.

Point Davenport Conservation Park

Point Davenport Conservation Park includes a semi-stranded lagoon, joined to the sea through a tidal inlet and inundated once or twice a year during very high tides. This is a wetland/estuary of national significance and a rare example of a stranded lagoon (Environment Australia, 2001). It is classified in the Directory of Important Wetlands as a Marine and Coastal Zone Wetland type A10 - a brackish to saline lagoon and marsh with one or more relatively narrow connections with the sea (Environment Australia, 2001). The criteria for listing were:

1. It is a good example of a wetland type occurring within a biogeographic region.
2. It is a wetland that is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail.
3. The wetland supports native plant or animal taxa or communities that are considered endangered or vulnerable at a national level.

Warrenben Conservation Park

Warrenben Conservation Park is located over a known groundwater basin. Groundwater is sourced on the park for fire-fighting purposes and a water-bore, windmill and tank are located there. Rising, saline groundwater may have some long-term impacts on native vegetation, but there is insufficient information regarding the extent of this.

Wills Creek Conservation Park

Wills Creek Conservation Park includes a wetland/estuary of national significance. It is classified on the Directory of Important Wetlands as comprising Marine and Coastal Zone Wetland types A1, A2, A7, A8, and A9 (Environment Australia, 2001). Also included in the listing is the human-made Wetland type C4 – the salt pans located on land managed by Cheetham Salt Ltd adjacent to the park. The criteria for listing were:

1. It is a good example of a wetland type occurring within a biogeographic region.
2. The wetland supports native plant or animal taxa or communities that are considered endangered or vulnerable at a national level.

Cheetham Salt Ltd have undertaken monitoring of outflows from the Price River. Park managers should maintain effective working arrangements with the managers of Cheetham Salt Ltd to share information. The company operates salt pans adjoining the park and within the park, and the natural and artificial wetlands in this area are providing a range of complementary habitat types.

Objectives

Maintain and improve, where possible, the parks' hydrological systems (whether tidal, surface or groundwater) and take steps to improve water quality.

Maintain the parks' wetlands and estuaries in a healthy condition.

Strategies

- Manage, and control where necessary, public access to wetland and estuarine areas to minimise impacts on condition and tidal flows.
- Maintain effective working partnerships with the Northern and Yorke NRM Board and local landholders to facilitate monitoring of the quality and volume of water entering the head of the gulf. Determine if the wetland/estuary of national significance in Clinton Conservation Park is being negatively impacted by activities occurring in the wider catchment area and mitigate these impacts where possible.
- Through liaison with the Northern and Yorke NRM Board and DWLBC ensure that the condition of the small brackish waterhole at Point Davenport Conservation Park is monitored and implement management strategies to protect its integrity.
- Liaise with DWLBC, the Northern and Yorke NRM Board, and other organisations regarding monitoring of groundwater in Warrenben Conservation Park and its possible impact on native vegetation.
- Monitor the quality and volume of water out-flowing from Price River at Wills Creek Conservation Park, to ensure it is not negatively impacted by the adjacent mining operations.
- Maintain an effective working arrangement with Cheetham Salt Ltd to ensure the habitats surrounding the natural and artificial wetlands in and around Wills Creek Conservation Park are protected and conserved.
- Participate in local and regional catchment water and groundwater management programs, collaborating with neighbours, relevant authorities, in particular the Northern and Yorke NRM Board, in support of on-park and off-park hydrological management, groundwater salinity mitigation and water quality improvement.

5.3 Native Vegetation

The Mainland Conservation Parks of Yorke Peninsula cover a variety of land systems. Their associated native vegetation communities include coastal dunes, limestone coastal cliffs, salt marshes and marine meadows, as well as open scrub and low woodlands. Vegetation on the parks of Yorke Peninsula has all been altered to some extent by previous land use and by the presence of introduced species. Therefore, the presence of remnant native vegetation is a key natural value for these parks and its conservation a primary management objective.

There are several species of conservation significance found in the parks (see Table 1).

Bird Islands Conservation Park

The two islands forming Bird Islands Conservation Park are fringed by Grey Mangrove (*Avicennia marina* ssp. *marina*) woodlands and chenopod shrublands. A tall open shrubland of Coast Daisy-bush (*Olearia axillaris*) and grasslands of introduced species occur on the sandy, higher ground. The mainland section of the park at Warburto Point is similar but with some sandy beach areas backed by dunes supporting Coast Daisy-bush and various *Acacia* spp. shrublands. Nine native plant species have been recorded in this park, though none with national or state conservation ratings.

Carribe Conservation Park

The vegetation of Carribe Conservation Park comprises open scrub dominated by Coastal White Mallee (*Eucalyptus diversifolia*) and Red Mallee (*E. oleosa*) with an understorey that includes species of *Calytrix*, *Acacia* and *Correa*. Some sections of the park contain Drooping Sheoak (*Allocasuarina verticillata*) woodland. There are 81 native plant species recorded from this park, though the only known species of conservation significance is the Western Daddy-long-legs (*Caladenia bicallata* ssp. *bicallata*) (SA: R)¹.

Clinton Conservation Park

Clinton Conservation Park comprises an elongated, narrow coastal strip incorporating an extensive tract of intertidal environments, including Grey Mangrove woodlands and Samphire associations, which are regularly inundated.

The park was classified into seven distinct vegetation communities by Martin (1980). Those communities and their dominant species are:

1. Mangrove woodland – Grey Mangrove.
2. Low (Samphire) shrubland - Scrubby Samphire (*Sclerostegia arbuscula*) and various other samphires (*Sarcocornia* spp).
3. Low shrubland - Marsh Saltbush (*Atriplex paludosa*), Salt Bluebush (*Maireana oppositifolia*) and Nitre-bush (*Nitraria billardieri*).
4. Open scrub – Marsh Saltbush, Salt Bluebush and Nitre-bush in addition to Common Boobialla (*Myoporum insulare*), Coast Daisy-bush (*Olearia axillaris*) and Sea Box (*Alyxia buxifolia*).
5. Low woodland - Dryland Tea-tree (*Melaleuca lanceolata* ssp. *lanceolata*) and Native Apricot (*Pittosporum angustifolium*).
6. Low scrubland - Bitter Saltbush (*Atriplex stipitata*) and Short-leaf Bluebush (*Maireana brevifolia*).
7. Open scrub - Yorrell (*Eucalyptus gracilis*).

The native vegetation is mainly degraded along well-traversed access tracks. In particular, the low Samphire shrubland in the park has experienced dieback due to extended dry seasons over the last five years. However, there are infestations of introduced plant species throughout and some areas are recovering from grazing impacts. Management strategies should target rehabilitation of these areas. Of the 85 native species recorded, there is only one with state level conservation significance; Scaly Poa (*Poa fax*) (SA: R) although there are a number of other species of regional conservation interest.

Leven Beach Conservation Park

This park protects a healthy pocket of coastal dune system vegetation with 127 native species recorded (Graham et al., 2001). Colonising plants on the foredune include Coast Saltbush (*Atriplex cinerea*) and Rolling Spinifex (*Spinifex sericeus*). Behind the foredune, a diversity of species forms a low shrubland community with Coast Daisy-bush, Common Boobialla and Sea Box prominent. Further inland there are Drooping Sheoak and Dryland Tea-tree woodlands with an understorey including Coast Daisy-bush and Coast Salt Bush. Sticky Daisy-bush (*Olearia passerinoides* ssp. *glutescens*) (SA: R) is the only species of conservation significance that has been recorded in this park. Stands of Smooth Cutting-grass (*Gahnia filum*) are supported by the park,

¹ Appendix B provides a description of the conservation status codes used in this section.

Table 1: Recorded Flora Species of Conservation Significance

Scientific Name	Common Name	Conservation Status *			Species Presence ^								
		AUS	SA	YP									
					Bird Islands CP	Caribie CP	Clinton CP	Leven Beach CP	Minlacowie CP	Point Davenport CP	Ramsay CP	Warrenben CP	Wills Creek CP
<i>Acacia enterocarpa</i>	Jumping-jack Wattle	E	E	E							*		
<i>Caladenia bicalliata</i> ssp. <i>bicalliata</i>	Western Daddy-long-legs		R	R		*						*	
<i>Caladenia brumalis</i>	Winter Spider-orchid	V	V	V					*		*		
<i>Caladenia conferta</i>	Coast Spider-orchid	E	E	E							*		
<i>Daviesia benthamii</i> ssp. <i>humilis</i>	Mallee Bitter-pea		R	K					*				
<i>Euphrasia collina</i> ssp. <i>osbornii</i>	Osborn's Eyebright	E	E	E							*		
<i>Halosarcia flabelliformis</i>	Bead Samphire	V	V	T									*
<i>Leionema microphyllum</i>	Limestone Phebalium		R	R								*	
<i>Levenhookia stipitata</i>	Common Stylewort		R						*				
<i>Olearia passerinoides</i> ssp. <i>glutescens</i>	Sticky Daisy-bush		R	R				*					
<i>Phyllanthus calycinus</i>	Snowdrop Spurge		R	R								*	
<i>Pleuropappus phyllocalymmeus</i>	Silver Candles	V	V	V				suspected					
<i>Poa drummondiana</i>	Knotted Poa		R	K						*		*	
<i>Poa fax</i>	Scaly Poa		R	R			*						
<i>Poa meionectes</i>	Fine-leaf Tussock-grass		V									*	
<i>Prasophyllum calcicola</i>	Limestone Leek-orchid		V	V								*	
<i>Prasophyllum goldsackii</i>	Goldsack's Leek-orchid	E	E	R								*	
<i>Pycnosorus globosus</i>	Drumsticks		V					*				*	
<i>Stackhousia annua</i>	Annual Candles	V	V	V								*	
<i>Thysanotus tenellus</i>	Grassy Fringe-lily		R									*	
<i>Triglochin minutissimum</i>	Tiny Arrowgrass		R	R						*			

* See Appendix B for conservation status codes

^ CP = Conservation Park

YP = Yorke Peninsula

which is a food source for the nationally endangered Yellowish Sedge-skipper Butterfly (*Hesperilla donnysa donnysa* form *flavescens*) (Grund, 2002). Current threats to the Smooth Cutting-grass, thus directly impacting on the butterfly, include overgrazing by kangaroos (see Section 5.4 Native Fauna), chemical spray drift, bushfire and the removal of nectar plants such as Dryland Tea-tree. Protection of nectar plants by fencing and using appropriate signage should be considered. Improving the connectivity between isolated or scattered patches of Smooth Cutting-grass, or revegetating using this plant, has been suggested for northern suburban Adelaide and might be implemented for Yorke Peninsula.

Minlacowie Conservation Park

Minlacowie Conservation Park is a remnant area of low open-scrub on sandy soil, dominated by Ridge-fruited Mallee (*Eucalyptus incrassata*) together with Narrow-leaf Red Mallee (*E. leptophylla*) and Beaked Red Mallee (*E. socialis*). Dryland Tea-tree and Broom-bush (*Melaleuca uncinata*) are also prominent. There is a good ground cover including Mallee Bitter-pea (*Daviesia benthamii* spp. *humilis*) (SA: R), Rosemary Damperia (*Dampiera rosmarinifolia*) and Common Stylewort (*Levenhookia stipitata*) (SA: R), and relatively few introduced species. This type of habitat is now rather rare on Yorke Peninsula, and is an area of high biodiversity, with at least 87 native plant species observed, of which the Winter Spider-orchid (*Caladenia brumalis*) (AUS: V; SA: V) is a species of high conservation significance.

Point Davenport Conservation Park

The wetland in Point Davenport Conservation Park conserves the southernmost example of tidal samphire and mangrove habitats on Yorke Peninsula (Graham et al., 2001). There have been 109 native plant species recorded for this park. The estuarine lagoon is fringed by Swamp Paper-bark (*Melaleuca halmaturorum*) woodland that is not conserved elsewhere on Yorke Peninsula (Whisson, 1983 unpub. cited in Environment Australia, 2001). Thick seaweed banks protect the foreshore and dune system. The dunes themselves support an open heath with species such as Coast Beard-heath (*Leucopogon parviflorus*), Sea Box, Coast Wallowa (*Acacia nematophylla*), Coast Daisy-bush, Black-anther Flax-lily (*Dianella revoluta* var. *revoluta*), with Emu Grass (*Distichlis distichophylla*) present in the ground cover.

Ramsay Conservation Park

Ramsay Conservation Park, although small, occurs in a high priority bioregion and is an area of high biodiversity, with 80 native plant species. It supports native vegetation in very good condition. It is the only known National Parks and Wildlife Act reserve that conserves Jumping-jack Wattle (*Acacia enterocarpa*) (AUS: E; SA: E). It also has three other species of conservation significance; Osborn's Eyebright (*Euphrasia collina* ssp. *osbornii*) (AUS: E, SA: E), Coast Spider-orchid (*Caladenia conferta*) (AUS: E, SA: E, YP: E) and Winter Spider-orchid (*Caladenia brumalis*) (AUS: V, SA: V), as well as species endemic to the state and/or region.

A large proportion of Ramsay Conservation Park supports Mallee Box (*Eucalyptus porosa*)/Drooping Sheoak woodland with intact grassy understorey in generally good condition. Temperate grassy woodland such as this is a rarity in South Australia because this vegetation has been largely cleared for agriculture. The edge of the bush block, especially along the northern and western sides of this property have suffered from degradation due to weed invasion from adjoining paddocks and disturbance associated with the perimeter track. Although overall there is minimal weed invasion, there is potential for further weed invasion in the future if the park undergoes any significant disturbance.

Warrenben Conservation Park

This park constitutes a major proportion of the only large remnant area of native vegetation left on southern Yorke Peninsula (Graham et al., 2001). The understorey has high biodiversity with 233 native plant species recorded, although a number of introduced species are also found on the park. Mallee plant community covers the north-eastern and southern sections of the park and includes species such as Coastal White Mallee, Red Mallee, Mallee Box and Sessile-fruit White Mallee (*E. phenax*). The understorey includes species of *Calytrix*, *Acacia*, *Correa* and *Templetonia*. The north-western section of the park includes tracts of low open woodland dominated by Drooping Sheoak and Dryland Tea-tree as well as stands of Scrubby Cypress Pine (*Callitris canescens*). The central section is a mix of the two habitat types. Annual Candles (*Stackhousia annua*) (AUS: V; SA: V; YP: V) and numerous other species of conservation significance occur in this park (see Table 1). Annual Candles require monitoring and a

management regime that is supportive (eg care in track and firebreak maintenance, protection from trampling etc). The Biodiversity Plan for the Northern Agricultural Districts recommends establishing a research and monitoring program along the northern boundary of the park to determine the best fire break management practices to ensure the long-term survival of this species (Graham, et al., 2001).

Warrenben Conservation Park also supports stands of Sour-bush (*Choretrum glomeratum*), the larval food plant for the Small Brown Azure Butterfly (*Ogyris otanes*). This butterfly is now only found within or near large, pristine Mallee areas and evidently has been targeted by collectors (Grund, 1999) (see Section 5.4 Native Fauna).

Wills Creek Conservation Park

Wills Creek Conservation Park incorporates a nationally listed wetland and estuary of interest, including an extensive area of Grey Mangrove woodland and adjoining shrubland habitat dominated by Scrubby Samphire and Beaded Samphire (*Sarcocornia quinqueflora*).

The limestone escarpment north of the township of Price supports low woodland of Red Mallee, Dryland Tea-tree and Spear Grass (*Austrostipa* spp.). Only six native plants have been recorded thus far, none of which have a conservation rating. However, there have been observations of Bead Samphire (*Halosarcia flabelliformis*) (AUS: V, SA: V, YP: T) in the park and this sighting should be verified given the species is considered to be of high conservation significance.

Mundulla Yellows

Mundulla Yellows is a progressive dieback syndrome that affects a variety of native plants, including species of *Eucalyptus*, *Acacia*, *Melaleuca* and *Allocasuarina*. It is mainly found in disturbed vegetation and early symptoms include yellowing of leaf veins on the tip of a single branch; progressive yellowing and dieback then occur. Current research indicates that Mundulla Yellows may be caused by a complex interaction of physical and chemical soil properties. Although not currently reported in the Mainland Conservation Parks of Yorke Peninsula, it does occur throughout the peninsula, therefore measures should be taken to recognise initial symptoms of this syndrome in species that may be affected.

Objective

Protect remnant native vegetation associations and reduce threats to plants or communities of conservation significance.

Strategies

- Develop a vegetation management plan for all parks covered in the management plan in order to prioritise resources and management activities.
- Monitor natural regeneration (or undertake appropriate revegetation, particularly in the degraded areas of Clinton Conservation Park).
- Monitor health of significant wetland habitats in Clinton, Point Davenport and Wills Creek Conservation Parks.
- Protect and replant stands of Smooth-cutting Grass and Sour-bush where possible to provide habitat for the Yellow Sedge-skipper Butterfly and Small Brown Azure Butterfly.
- Develop and implement a research and monitoring program to determine the best fire break management practices to ensure the long-term survival of Annual Candles in Warrenben Conservation Park.
- Monitor Ramsay Conservation Park and take the necessary steps to prevent weed infestation and ensure protection of Osborn's Eyebright.
- Monitor the parks for signs of vegetation distress which can lead to Mundulla Yellows.
- Encourage and support scientific research, particularly on threatened species and communities of conservation significance.

5.4 Native Fauna

Several of the parks support noteworthy populations of native fauna species, in particular sea bird breeding colonies and three bird species of high conservation significance, Malleefowl (*Leipoa ocellata*) (AUS: V; SA: V, YP: E)¹, Slender-billed Thornbill (*Acanthiza iredalei*) (AUS: V; SA: V, YP: V) and Western Whipbird (*Psophodes nigrogularis leucogaster*) (AUS: V; SA: V, YP: V). In a region with little remaining native vegetation, these parks provide habitat that is vital for the survival of birds, native mammals, reptiles and invertebrates, including two notable butterfly species. Species with conservation ratings are listed in Table 2.

In reserves of this type, where biodiversity conservation and the long-term continued existence of native wildlife populations, particularly threatened species, are major goals, repeat fauna surveys, ongoing research and regular monitoring of those populations is desirable and should be encouraged.

Mammals

Mammals found on the parks include the Western Grey Kangaroo (*Macropus fuliginosus*), found throughout most of Yorke Peninsula, and the Euro (*M. robustus*), recorded on Clinton Conservation Park. Other mammals identified within the parks include the Australian Sea-lion (*Neophoca cinerea*) (AUS: V, SA: V), Lesser Long-eared Bat (*Nyctophilus geoffroyi*), Western Pygmy Possum (*Cercartetus concinnus*), the Brushtail Possum (*Trichosurus vulpecula*) (SA: R), Micro Bats and the Short-beaked Echidna (*Tachyglossus aculeatus*).

The Western Grey Kangaroo poses a significant management issue for Yorke Peninsula. Although many native animal species have declined or become extinct since European settlement, kangaroo numbers have generally increased, often above ecologically sustainable levels. This may be attributed to the increased availability of fresh water (eg artificial watering points) and food resources (agricultural crops), and lack of predators. Increased kangaroo numbers can have major impacts on native vegetation, fences, pastures and crops. A kangaroo management program is in place in South Australia (Department for Environment and Heritage, 2008) and permits can be issued to landowners to reduce the impacts caused by high kangaroo numbers. Successful management of kangaroo populations can only be achieved if undertaken and coordinated at a regional scale. The Department for Environment and Heritage will liaise with regional landowners regarding management of kangaroo populations on Yorke Peninsula.

Birds

The Mainland Conservation Parks of Yorke Peninsula support a wide variety of bird species. Clinton, Point Davenport and Warrenben Conservation Parks are of particular conservation significance due to the birdlife they support. Approximately 138 bird species have been recorded in Clinton Conservation Park; the Australasian Wader Studies Group of Birds Australia and the World Wide Fund for Nature claim this to be the fifth most important site in Australia in terms of providing habitat for migratory wading birds (Department for Environment and Heritage, 2005a;b). Australia is party to international agreements regarding the conservation of migratory birds (Japan-Australia and China-Australia Migratory Bird Agreements) and several of these migrant shorebirds that are listed under those treaties regularly visit some of the parks, namely Bird Islands, Clinton, Point Davenport, and Wills Creek Conservation Parks (Table 3).

Clinton Conservation Park is understood to accommodate a large Cormorant (*Phalacrocorax* spp.) rookery on the eastern side of the gulf. The park has been used as a research site for the Samphire-favouring Slender-billed Thornbill. Other birds with conservation ratings recorded from the park include the Blue-winged Parrot (*Neophema chrysotoma*) (SA: V) and White-bellied Sea-Eagle (*Haliaeetus leucogaster*) (SA: E).

Reptiles

Throughout the conservation parks of Yorke Peninsula a number of reptiles have been observed. These include Skinks, Geckos, Goannas, Dragons and Snakes. Wills Creek Conservation Park support three known reptile species: the Southern Grass Skink (*Pseudemoia entrecasteauxii*), Four-toed Earless Skink (*Hemiergis peronii*) and the Dwarf Skink (*Menetia greyii*). Fauna surveys for reptiles are required for many of the parks, especially Carribee, Clinton, Minlacowie and Ramsay Conservation Parks.

¹ Appendix B provides a description of the conservation status codes used in this section.

Table 2: Recorded Fauna Species of Conservation Significance.

Scientific Name	Common Name	Conservation Status *			Species Presence ^								
		AUS	SA	YP	Bird Islands CP	Carribe CP	Clinton CP	Leven Beach CP	Minlacowie CP	Point Davenport CP	Ramsay CP	Warrenben CP	Wills Creek CP
<i>Acanthiza iredalei</i>	Slender-billed Thornbill	V	V	V			*						*
<i>Actitis hypoleucos</i>	Common Sandpiper		R	O									*
<i>Anas rhynchos</i>	Australasian Shoveler		R	R			*						
<i>Ardeotis australis</i>	Australian Bustard		V	X			*						
<i>Arenaria interpres</i>	Ruddy Turnstone		R				*		*				*
<i>Biziura lobata</i>	Musk Duck		R	U			*						*
<i>Calidris alba</i>	Sanderling		R	O					*				
<i>Calidris melanotos</i>	Pectoral Sandpiper		R	O			*						*
<i>Calidris tenuirostris</i>	Great Knot		R	O			*						*
<i>Cereopsis novaehollandiae</i>	Cape Barren Goose		R	R	*								
<i>Charadrius leschenaultii</i>	Greater Sand Plover		R	O	*		*						*
<i>Charadrius mongolus</i>	Lesser Sand Plover		R	O	*		*						
<i>Chrysococcyx lucidus</i>	Shining Bronze-Cuckoo		R	R							*		*
<i>Cladorhynchus leucocephalus</i>	Banded Stilt		V				*						*
<i>Egretta garzetta</i>	Little Egret		R	U			*						*
<i>Falco peregrinus</i>	Peregrine Falcon		R	R			*						
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher		R	U					*				*
<i>Haematopus longirostris</i>	Pied Oystercatcher		R	U	*				*				*
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle		E	V			*						*
<i>Heteroscelus brevipes</i>	Grey-tailed Tattler		R	O	*		*		*				
<i>Leipoa ocellata</i>	Malleefowl	V	V	E								*	
<i>Lichenostomus cratitius</i>	Purple-gaped Honeyeater		R	V				*					
<i>Limosa lapponica</i>	Bar-tailed Godwit		R				*						*
<i>Limosa limosa</i>	Black-tailed Godwit		R	O									*
<i>Myiagra inquieta</i>	Restless Flycatcher		R	V							*		*
<i>Neophema chrysostoma</i>	Blue-winged Parrot	V	V	O			*						
<i>Neophema elegans</i>	Elegant Parrot		R	K			*						*
<i>Neophema petrophila</i>	Rock Parrot		R	R	*		*		*		*		*
<i>Neophoca cinerea</i>	Australian Sea-lion	V	V						*				
<i>Numenius madagascariensis</i>	Eastern Curlew		V	V			*		*				*
<i>Numenius phaeopus</i>	Whimbrel		R	O			*		*				*
<i>Pandion haliaetus</i>	Osprey		R	R	*								*
<i>Philomachus pugnax</i>	Ruff		R	O			*						
<i>Plectorhyncha lanceolata</i>	Striped Honeyeater		R	E							*		
<i>Plegadis falcinellus</i>	Glossy Ibis		R	R			*		*				
<i>Pluvialis fulva</i>	Pacific Golden Plover		R				*		*				
<i>Podiceps cristatus</i>	Great Crested Grebe		R	R									*
<i>Psophodes nigrogularis leucogaster</i>	Western Whipbird (Eastern subspecies)	V	E	V								*	
<i>Stagonopleura guttata</i>	Diamond Firetail		V	E								*	
<i>Sterna nereis</i>	Fairy Tern		V	V	*		*		*				*
<i>Thinornis rubricollis</i>	Hooded Plover		V						*				
<i>Tringa glareola</i>	Wood Sandpiper		R	O			*						
<i>Turnix varia</i>	Painted Button-quail		V	V				*					
<i>Xenus cinereus</i>	Terek Sandpiper		R	O	*		*						*

* See Appendix B for conservation status codes ^ CP = Conservation Park YP = Yorke Peninsula

Fish and crustaceans

Data obtained from recreational fishing catches in Wills Creek Conservation Park indicate that the following fish and crustacean species are present in Wills Creek: Yellow-eye Mullet (*Aldrichetta forsteri*), Tommy Ruff (*Artipis georgianus*), South Australian Garfish (*Heriramphus melanochir*), King George Whiting (*Sillaginodes punctatus*), Silver Whiting (*Sillago bassensis*), Southern Fiddler Ray (*Trygonorhina fasciata*) and Blue Swimmer Crab (*Portunus pelagicus*). Pebble Crabs (*Philyra undecimspinosa*) have been noted in Point Davenport.

Invertebrates

Leven Beach Conservation Park may support populations of the Yellowish Sedge-skipper Butterfly as the park includes stands of Smooth Cutting-grass required by the larva that feed (only) on this species. This form of the butterfly is considered rare in South Australia and any further habitat deterioration would increase their vulnerability (Grund, 2002). The area of Smooth Cutting-grass should be protected and included in any regeneration projects.

Warrenben Conservation Park provides habitat for the Small Brown Azure Butterfly, considered vulnerable on mainland South Australia but stable on Kangaroo Island (Grund, 1999). It is a target of butterfly collectors. There is a recovery plan for Small Brown Azure Butterflies (Action Plan for Australian Butterflies *Ogytris otanes*) that mentions the local population of these insects and recommends taking steps to render the Yorke Peninsula populations more secure (Sands and New, 2005). The butterflies' larval food plant in South Australia is Common Sour-bush (*Choretrum glomeratum*). The butterfly is found only within or adjacent to large, pristine mallee areas that support populations of this food plant. Common Sour-bush is a root parasite favoured by rabbits and kangaroos and frequently regenerates in newly disturbed mallee, especially along the edges of new road works such as fire access tracks. Fires, plant succession and vehicle use are seen as threats and need to be taken into consideration by park managers (Sands and New, 2005).

Objective

Protect the native fauna and their habitats, in particular those of conservation significance.

Strategies

- Identify and protect native fauna, primarily through the protection of native habitats (especially that of breeding sea birds). Take fauna habitat requirements into account when planning and undertaking species management or recovery plans, native vegetation rehabilitation or introduced plant control programs.
- Avoid disturbance to sea bird colonies particularly during breeding seasons and especially for any threatened species. Restrict human access to the vicinity of roosting and nesting sites when and where necessary.
- Raise community awareness of native wildlife and species conservation requirements, justifying the need for restrictions imposed on public access.
- Identify and monitor populations of threatened species and where necessary, develop management plans for their conservation.
- Encourage and support scientific research and ongoing monitoring to enhance knowledge and support wildlife management programs.
- Undertake biological surveys to augment the fauna database, particularly with other mammal and reptile species.

Table 3: Birds listed under the Japan-Australia and the China-Australia Migratory Birds Agreements

Scientific Name	Common Name	Migratory Agreement		Species Presence ^								
		JAMBA (')	CAMBA (#)	Bird Islands CP	Carribe CP	Clinton CP	Leven Beach CP	Miniacowie CP	Point Davenport CP	Ramsay CP	Warrenben CP	Wills Creek CP
<i>Actitis hypoleucos</i>	Common Sandpiper	*	*									*
<i>Ardea alba</i>	Great Egret	*	*			*						*
<i>Arenaria interpres</i>	Ruddy Turnstone	*	*			*			*			*
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	*	*	*		*			*			*
<i>Calidris alba</i>	Sanderling	*	*			*						
<i>Calidris canutus</i>	Red Knot		*	*		*			*			*
<i>Calidris ferrunginea</i>	Curlew Sandpiper	*	*			*			*			*
<i>Calidris melanotos</i>	Pectoral Sandpiper					*						
<i>Calidris ruficollis</i>	Red-necked Stint	*	*	*		*			*			*
<i>Calidris tenuirostris</i>	Great Knot	*	*			*						*
<i>Charadrius leschenaultii</i>	Greater Sand Plover	*	*	*		*						
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle		*			*						
<i>Heteroscelus brevipes</i>	Grey-tailed Tattler	*	*	*		*						
<i>Limosa lapponica</i>	Bar-tailed Godwit	*	*			*						
<i>Limosa limosa</i>	Black-tailed Godwit	*	*									*
<i>Numenius madagascariensis</i>	Eastern Curlew	*	*			*			*			*
<i>Numenius phaeopus</i>	Whimbrel	*	*			*						
<i>Philomachus pugnax</i>	Ruff	*	*			*						
<i>Plegadis falcinellus</i>	Glossy Ibis		*			*						
<i>Pluvialis fulva</i>	Pacific Golden Plover	*	*						*			
<i>Pluvialis squatarola</i>	Grey Plover	*	*			*						*
<i>Sterna caspia</i>	Caspian Tern		*	*		*	*		*			*
<i>Tringa glareola</i>	Wood Sandpiper	*	*			*						
<i>Tringa stagnatilis</i>	Marsh Sandpiper		*			*						*
<i>Xenus cinereus</i>	Terek Sandpiper	*	*	*								

(') Japan-Australia Migratory Birds Agreement

(#) China-Australia Migratory Birds Agreement

^ CP = Conservation Park

5.5 Introduced Plants

Introduced plants are regarded as one of the major threats to natural biodiversity and all of the parks have populations of introduced plant species which can threaten the integrity of the native vegetation communities. While all introduced species have the potential to threaten the integrity of natural ecosystems, the 14 species listed in Table 4 are declared plants that require control under the *Environment Protection and Biodiversity Conservation Act 1999* and/or *Natural Resources Management Act 2004*. DEH must liaise with the Northern and Yorke NRM Board with regard to control of declared plants.

Table 4: Declared Plants

SCIENTIFIC NAME	COMMON NAME	EPBC Act 1999 #	NRM Act 2004 ^
<i>Asparagus asparagoides</i>	Bridal Creeper	*	*
<i>Asphodelus fistulosus</i>	Onion Weed		*
<i>Diplotaxis tenuifolia</i>	Lincoln Weed		*
<i>Echium plantagineum</i>	Salvation Jane		*
<i>Euphorbia terracina</i>	False Caper		*
<i>Moraea flaccida</i>	One-leaf Cape Tulip		*
<i>Lycium ferocissimum</i>	African Boxthorn		*
<i>Marrubium vulgare</i>	Horehound		*
<i>Oxalis pes-caprae</i>	Soursob		*
<i>Solanum elaeagnifolium</i>	Silverleaf Nightshade		*
<i>Cenchrus incertus</i> , <i>C. longispinus</i>	Innocent Weed		*
<i>Olea europaea</i>	Olive		*

Environmental Protection and Biodiversity Conservation Act 1999

^ Natural Resources Management Act 2004

Probably the most widespread introduced plant in this region is the African Boxthorn (*Lycium ferocissimum*) that has been very successful in self-colonising a wide variety of habitats on Yorke Peninsula. African Boxthorn is particularly widespread in Yorke Peninsula. It was initially introduced and promoted as a hedge plant to provide shelter from wind and as a barrier to stock movement. African Boxthorn is widespread on Clinton Conservation Park, despite considerable efforts to control it over many years. 'Cut and swab' methods have been used most recently by DEH personnel and volunteers. In the past, tractors were used to physically remove the plants and more recently a mechanical 'plucker' has been trialled. The African Boxthorn control program should continue into the future with NRM funding support.

An African Boxthorn infestation at Leven Beach Conservation Park is currently being controlled using a mechanical 'plucker' with NRM funding support. Some control work on African Boxthorn at Point Davenport Conservation Park has taken place previously and should be continued. Concern has been expressed that other weed plants are invading the park from the road reserve(s) within the park boundaries. This issue might be addressed in collaboration with the shack lessee.

Another environmental weed that poses a serious threat is Bridal Creeper (*Asparagus asparagoides*). This nationally declared weed was introduced to South Australia primarily as a garden plant, and is found throughout most of the parks. Other problem species in grassy areas include Bridal Veil (*Asparagus declinatus*), False Caper (*Euphorbia terracina*), Horehound (*Marrubium vulgare*), Lincoln Weed (*Diplotaxis tenuifolia*), One-leaf Cape Tulip (*Moraea flaccida*) and Salvation Jane (*Echium plantagineum*). Other invasive species include Sea Rocket (*Cakile maritima*), Common Iceplant (*Mesembryanthemum crystallinum*), Onion Weed (*Asphodelus fistulosus*), Sour Sob (*Oxalis pes-caprae*) and Sow Thistles (*Sonchus* spp.). Biological control of Salvation Jane has been attempted at Clinton Conservation Park and a specialized control program is in progress for stands of Agaves (*Agave* spp.) which are present in the park. The declared Calomba Daisy (*Oncosiphon suffruticosum*) has been recorded within close proximity of

Clinton Conservation Park. Park managers should be aware of this and prevent the spread of this invasive species into the park where possible.

Ramsay Conservation Park has a small ruin (refer to Section 7.2 Non-Aboriginal Heritage), which has a high concentration of weeds due to previous disturbance, compared to the rest of the park. Weeds present here have the potential to invade the surrounding undisturbed bush. Capeweed (*Arctotheca calendula*), False Caper, and Yellow Burweed (*Amsinckia* ssp.) are the most abundant weeds, along with woody weeds such as African Boxthorn, Pepper Tree (*Schinus molle*), Wormwood (*Artemisia* ssp.) and Pimpernel (*Anagallis arvensis*). There are also a number of species that are Australian natives but non-indigenous to the local area that have been widely planted for amenity and shade. Some have the ability to become invasive pests (eg Western Coastal Wattle (*Acacia cyclops*), Golden Wreath Wattle (*A. saligna*) and the Round-leaved Moort (*Eucalyptus platypus*)) by spreading and invading native vegetation. A watching brief needs to be kept on these species and early intervention taken to control outbreaks. The removal of introduced and non-indigenous native species should happen gradually as the native vegetation improves.

Objectives

Control, and eradicate where possible, introduced plants within the parks.

Prevent the establishment of threatening introduced plants within the parks.

Strategies

- Continue control of priority weeds where required.
- Poison or remove introduced species in the highest biodiversity areas using minimal disturbance methods wherever possible.
- Provide information to raise community awareness of the adverse impacts of introduced plants on natural biodiversity and the benefits of control programs.
- Liaise and work cooperatively with the Northern and Yorke NRM Board to implement regional weed control programs that target significant weed species.

5.6 Introduced Animals

Introduced animals recorded within the Mainland Conservation Parks of Yorke Peninsula include the European Rabbit (*Oryctolagus cuniculus*), the European Hare (*Lepus europaeus*), the House Mouse (*Mus musculus*), the Black Rat (*Rattus rattus*) and the Red Fox (*Vulpes vulpes*). The Feral Cat (*Felis catus*) and a number of introduced bird species such as the Pigeon (*Columba livia*), House Sparrow (*Passer domesticus*), Goldfinch (*Carduelis carduelis*) and Common Starling (*Sturnus vulgaris*) are also widespread. Straying Sheep (*Ovis aries*) have been observed in Warrenben Conservation Park. All of these species are declared and require control in accordance with the *Natural Resources Management Act 2004*. DEH must liaise with the Northern and Yorke NRM Board with regard to control of these species.

Occasionally domestic dogs (*Canis domesticus*) are likely to frequent at least some of the parks either as strays from nearby residences or as visitors' companion animals. Goats (*Capra aegagrus hircus*) have been observed in Warrenben Conservation Park. Feral honeybees (*Apis mellifera*) are also present throughout the parks.

Introduced predators such as foxes and cats have seriously affected native fauna and invertebrates, although these animals also prey on introduced herbivores such as rabbits to a reasonable extent. Sand pad monitoring has been in place at Warrenben Conservation Park as a control for the fox baiting program occurring at Innes National Park. Fox baiting in Warrenben Conservation Park commenced in 2007 and, subject to monitoring, should be continued because of the presence of the vulnerable Malleefowl (*Leipoa ocellata*) and in view of the Tammar Wallaby (*Macropus eugenii*) re-introduction program occurring in nearby Innes National Park.

Rabbits are regarded as another serious problem, particularly in sandy-soil areas. They impede the regeneration of native plants, can cause soil erosion and thus promote weed invasion and degrade the understorey habitat for small native mammals and birds. Rabbits are susceptible to the Rabbit Haemorrhagic Disease (formerly known as Rabbit Calicivirus Disease (RCD)) and Myxomatosis diseases and can be controlled by careful application of 1080 and other poisons, bearing in mind that careless baiting programs can have the potential to adversely impact native fauna. Careful management through integrated control programs still remains the best way to

ensure that introduced animal numbers are reduced or eliminated with minimal off-target impact on native flora and fauna.

Martin (1980) considered domestic dogs and cats to be having a major effect on the fauna of Clinton Conservation Park near Port Wakefield. The author observed several cats and the footprints of cats and dogs in samphire areas several kilometres from the town limits, although some of these prints may have been from feral animals. The planned increase in the size of Port Wakefield in the future will lead to an increase in the number of domestic pets. DEH will work in partnership with the Wakefield District Council to prevent domestic animals having an impact on native fauna in the park wherever possible.

Feral honeybees are present in Leven Beach, Point Davenport and Warrenben Conservation Parks. A shack that was recently pulled down in Leven Beach Conservation Park was infested by feral bees, as is the cliff line along the beach. This could pose a threat to people camping near Leven Beach Conservation Park.

Management of feral honeybees is a contentious issue at best as there is insufficient information about interactions between honeybees and the Australian biota. Varying effects of honeybees on the native environment show that it is important to quantify the impact of feral animals on native species before any management decisions are made. Management of honeybees in areas set aside for conservation requires a regional approach that leads to the protection of natural resources within each region being maintained free from honeybees (Paton, 1996). Feral honey bees will be actively controlled if they pose a risk to park visitors.

The Ornate Kangaroo Tick (*Amblyomma triguttatum triguttatum*) has colonised the southern Yorke Peninsula within the past 30 years. Although its distribution has not been completely documented, current evidence suggests the tick is present within most remnant native vegetation patches on southern Yorke Peninsula. It uses kangaroos, livestock and rabbits as hosts, and can be transferred to humans through contact with grasses and understorey vegetation in their habitat. Its presence in Innes National Park, and, as newly reported, in Point Davenport and Leven Beach Conservation Parks, is a cause of considerable local public concern, as it is a vector for Q fever and bites from the tick can cause allergic dermatitis reactions in some people and therefore poses a potentially high public health risk (Waudby, 2006).

DEH has followed a preventative strategy for visitors to Innes National Park involving information and signage and advice on minimising contact with animals. This information will be updated to also warn that the ticks may be transferred through contact with vegetation. Continued support should be given to studies conducted through the University of South Australia to further study the ecology of the tick and possible management strategies, which could be implemented, for the Mainland Conservation Parks of Yorke Peninsula.

Objective

Control and manage introduced fauna within the parks.

Strategies

- Undertake and/or support fauna surveys to determine the extent of introduced animal populations and their impacts on native flora and fauna.
- Monitor introduced/pest animal populations and devise and implement landscape-scale integrated control/eradication programs, targeting rabbits, foxes and cats.
- Where priority pest animal control work proves necessary, work cooperatively with regional authorities and stakeholders as well as Friends' groups and volunteers, to achieve coordinated landscape control programmes.
- Provide information to raise community awareness of the adverse impacts of introduced fauna on natural biodiversity and the benefits of control programs.
- Continue research on feral bees and control populations if they pose a threat to park visitors.
- Support research on Ornate Kangaroo Ticks and instigate management strategies according to recommendations given by research.

6 MANAGING FIRE

There is potential for fires to occur in the Mainland Conservation Parks of Yorke Peninsula. Fire ignition sources in the district include lightning, campfires and burn-offs escaping from private land. District staff liaise regularly with neighbouring landowners, Country Fire Service (CFS) and District Bushfire Prevention Committees in order to address fire prevention issues and suppression requirements. Effective communication should be maintained with surrounding property owners with regard to seasonal burn-offs.

Fire management works are undertaken on some of the parks each year, with activities undertaken reflecting need and local circumstances (ie Mallee open-scrub is more fire-prone than Mangrove woodland). Changing conditions not only within but adjacent to the parks are also taken into account. Fire management normally involves activities such as grass/vegetation slashing and access track maintenance. Verge trimming and slashing of firetracks and boundaries occurs at Leven Beach, Point Davenport and Warrenben Conservation Parks. Maintaining access tracks within and around the boundaries of the parks (where this is necessary and feasible) should continue during the term of this management plan. Prescribed burning may be implemented to protect assets, reduce fuel loads and protect habitat.

Warrenben Conservation Park has significant habitat for the nationally and state vulnerable Malleefowl (*Leipoa ocellata*). The fire access track system in Warrenben Conservation Park is maintained annually, including verge trimming, regrowth slashing and track surface improvement. Elephant Road receives annual minor maintenance. Water-sources for fire fighting are maintained here, namely a water tank with a 45,000-litre capacity, which is filled by a solar operated pump from a bore.

While there are indicators that visitors occasionally make campfires in some localities, this practice is unsustainable and the ban on campfires on all the subject parks should remain. Campfires are also known to occur on beaches and adjacent to park boundaries such as in Clinton and Leven Beach Conservation Parks, with the potential threat of fires escaping into the parks.

A fire management plan for the parks of the southern Yorke Peninsula, incorporating Leven Beach, Minlacowie, Point Davenport, Ramsay, and Warrenben Conservation Parks, is in preparation by the Department for Environment and Heritage. Relevant stakeholders will be consulted during this process. Once prepared, this document will form the basis for ongoing fire management. The fire management plan should, to the fullest extent possible, take into account the environmental impact of proposed actions on natural features of the parks and prescribe steps designed to ameliorate those impacts.

Fire management planning will:

- ensure that sound conservation and land management principles are applied to fire management activities;
- identify natural and cultural heritage values and built assets;
- provide a framework for the management of bushfire suppression, including identification of strategic access and control lines; and
- provide a framework for prescribed burning for ecological management and fuel reduction purposes.

Objective

Manage fire to ensure biodiversity conservation, protection of life and property and the protection of natural, cultural and built values.

Strategies

- Develop, implement and review fire management plans in association with the CFS and other stakeholders.
- Continue to work with the CFS, relevant District Bushfire Prevention Committees, local Councils, neighbours and others to minimise risk to life and property within and surrounding the parks.
- Monitor the incidence and impact of fires on the parks' natural biodiversity.
- Continue to undertake seasonal fire preparation works, including maintenance of fire suppression equipment, water supplies and fire access tracks.
- Use prescribed fire, where appropriate, to reduce fuel hazards and manage biodiversity values.

7 MANAGING CULTURAL HERITAGE

7.1 Aboriginal Heritage

Narungga Culture and Heritage

Yorke Peninsula, as far north as Port Broughton and east to the Hummock Range, is recognised as the 'country' of the Narungga people (Tindale, 1974). Around the time of colonisation, the Narungga nation comprised four clans: the Kurnara in the north of the peninsula, the Windera in the east, the Wari in the west and the Dilpa in the south (ATNS - Narungga People – Agreements Database, 2001). Their neighbours were the Kurna of the Adelaide Plains and the Nukunu to the north, with whom the Narungga would meet for trade and ceremony. The land comprising the Mainland Conservation Parks of Yorke Peninsula was thus traditionally associated with the Narungga people, although it should be noted that the Kurna people have traditional associations with land on Clinton Conservation Park.

Following colonial settlement, the Narungga population was substantially reduced as a result of introduced diseases, removal and dispersal, dispossession of land and water supplies, and sometimes through violent conflict. Despite these adversities, many people of Narungga descent still live on or near their country and have maintained an interest in their culture.

Some of the language and traditional stories have been recorded. Although some traditional wisdom may have been irretrievably lost, over 1,000 words and phrases of Narungga language were recorded and are being spoken again (Voice of the Land, 2001). Other aspects of traditional culture and 'Dreaming' narratives are being re-established. However, due to historical or cultural reasons, any knowledge of the cultural heritage of the region may be privileged to selected Narungga people and therefore unable to be recorded. Given the lack of existing information, it is considered important that further research be undertaken in order to gain a better understanding of the Aboriginal occupancy and use of the area.

Department for Environment and Heritage staff should liaise with representatives of the Aboriginal people who have traditional associations with the Mainland Conservation Parks of Yorke Peninsula and take appropriate steps to facilitate their involvement with the parks and in implementing this plan of management, should they be interested in becoming involved. A useful initiative could be to identify Narungga place names and (with the concurrence of the traditional custodians) incorporate them into park signs and information material as a means of raising community awareness.

Aboriginal Heritage Act 1988

The purpose of the *Aboriginal Heritage Act 1988* (the Act) is the protection and preservation of Aboriginal sites, objects and remains. "Aboriginal site" and "Aboriginal object" are defined in the Act as: "an area of land or an object that is of significance according to Aboriginal tradition; or that is of significance to Aboriginal archaeology, anthropology or history." The Aboriginal Affairs and Reconciliation Division (AARD) of the Department of the Premier and Cabinet maintains a Central Archive, including the Register of Aboriginal Sites and Objects.

Currently there are two archaeological sites listed on the Central Archive for the subject parks, one for Bird Islands Conservation Park and one in the vicinity of Clinton Conservation Park, suggesting further sites are likely to exist within the park. It is presumed that this area would have been well used by Aboriginal people. It has been said that in the early days of colonial settlement, the stone store-shed located (off park) inland from Port Arthur was used as a temporary lock-up for Aboriginal prisoners before they were sent on to Adelaide by boat.

Any known Aboriginal cultural heritage sites and those that may be identified in the future, may require special protection. In managing the parks and carrying out the activities and strategies proposed in this plan, DEH will comply with the *Aboriginal Heritage Act 1988*. To ensure the protection of sites, DEH staff should consult with AARD and local Aboriginal Heritage Committee (Narungga Nations Aboriginal Corporation) before the commencement of any significant development works.

Objective

Ensure that any Aboriginal sites, objects and remains are protected and preserved in accordance with the *Aboriginal Heritage Act 1988* and Aboriginal people's involvement with park management is developed and strengthened.

Strategies

- Consult with the traditional landowners regarding the management of Aboriginal heritage and before proceeding with any significant management or development strategies within the parks.
- Identify and protect any Aboriginal sites, objects and remains in cooperation with the regional Aboriginal heritage committees and landowners, AARD and other relevant authorities.
- In consultation with the relevant regional Aboriginal heritage committees, submit cultural sites and stories that relate to the park for inclusion on the AARD Central Archive.

7.2 Non-Aboriginal Heritage

The non-Aboriginal history of these parks has not been thoroughly researched. As far as is known, they contain little of heritage significance, but more diligent searching and further investigation may uncover stories or items of interest. Historic research should be encouraged.

Explorer Matthew Flinders is said to have waded ashore across the mudflats in the vicinity of Clinton Conservation Park, and named both Gulf St Vincent and Yorke Peninsula. The head of the gulf was given the alternative name of Baie Caroline by Nicolas Baudin. Ramsay Conservation Park has a small ruin: a four-bedroom stone house. Although it has no roof, it is in a stable condition. A memorial plaque is located nearby. There are several garden plants such as Pepper tree (*Schinus molle*), Wormwood (*Artemisia absinthium*) and Blue Pimpernel (*Anagallis monelli*) around the ruin that should be removed.

There are shipwrecks in the adjacent waters that, although beyond park boundaries, are subject to legal protection under both the State (1981) and Federal (1976) *Historic Shipwrecks Acts*. Some of the wreck sites are well documented while others have not yet been located. They are protected by legislation and visitors to the park who dive or otherwise access the wreck sites should be made aware of the need to respect their historic significance.

Objective

Ensure that any sites or items of heritage significance are appropriately protected and interpreted.

Strategies

- In cooperation with relevant authorities, protect sites of historical significance that may be identified in the parks.
- Encourage further historical surveys and research that relate to the history of the parks or have relevance to the parks' previous land uses.

8 MANAGING TOURISM AND RECREATION

Since the parks covered by this management plan were established to conserve biodiversity, their protection is the primary objective of management. As such, visitor use, access and tourism must be compatible with this objective to ensure that the natural values of the parks are not compromised. Visitor use in the parks is reasonably low, and there are no current commercial tours operating within them; most visitor use in the region's parks is directed to Innes National Park.

8.1 Visitor Access

All of these parks can be reached by road and in some cases, by sea. For the most part however, there is limited internal vehicular access for visitors. In some cases, there are some 4WD tracks or walking trails that are available for public use.

Vehicle Access

Most of the parks are accessed by road. Bird Islands Conservation Park is accessed along Warburto Road, and the islands can be reached by wading out at low tide or by boat at high tide. Clinton Conservation Park can be accessed by vehicle from the Adelaide-Port Wakefield Highway NA1 and also from the main road south from Port Wakefield to Ardrossan. Wills Creek Conservation Park can be accessed mainly by boat, as it is a mangrove park. There is limited internal vehicle access in the parks of Yorke Peninsula.

Bird Islands Conservation Park has limited 4WD access on a network of sandy tracks, although this should be monitored since some environmental damage results from the use of these vehicles on the beach. With the increasing population in the Copper Coast District Council area, the impacts from 4WD and other visitor impacts are sure to increase and will need to be managed.

Clinton Conservation Park also has internal vehicular access through sandy 4WD tracks. Most of these lead to the shoreline. Trail bike use is also common in this park. Some of the tracks are officially designated whereas others have been created by informal use. These incursions may result in environmental damage and bogged vehicles. Use of undesignated tracks and trails is unsustainable and illegal. Management vehicle access tracks are maintained at Leven Beach and Warrenben Conservation Parks, but there is no legal public internal access. Despite this, vehicular incursions still occur, with vehicles being driven on the beach and unauthorised track making and riding of motorcycle/ATV/quad vehicles within the park.

Walking Trails

Minlacowie Conservation Park has no walking trails at this stage but can be accessed via the Cutline, Weavers North and Yacca Roads. Carribee, Point Davenport, Warrenben and Wills Creek Conservation Parks are public internal access only (walking) through some established trails and other walking trails that have been created by informal use.

Objective

Provide visitor access to the parks in a way that does not compromise natural values or the objectives of the management plan.

Strategies

- Monitor access to the parks to ensure that natural values are not compromised.
- Review the use and condition of any public tracks and trails in the parks, re-routing them and maintaining them where necessary while closing off others as required to ensure public safety and to allow native vegetation to regenerate.

8.2 Visitor Activities and Facilities

Visitor Activities

The Mainland Conservation Parks of Yorke Peninsula currently experience a low level of public use relative to Innes National Park. Accurate counts of visitor numbers are not available for the parks. For the coastal sites, visitors are for the most part interested in fishing, crabbing, boating and nature observation. Dogs are known to accompany their owners into some of the parks, contrary to the *National Parks and Wildlife (National Parks) Regulations 2001*. There are probably other,

more serious illegalities occurring including kangaroo and waterfowl shooting, firewood cutting and removal, rubbish dumping and campfires.

Visitor numbers are relatively few at Warrenben Conservation Park, and they are probably persons interested in nature observation. However, there is understood to be some illegal woodcutting, kangaroo shooting and vehicle intrusion occurring.

In most of the parks, bushwalking, nature observation and picnicking are common. A few fishers moor their boats off Sandy Point at Point Davenport Conservation Park. Currently few other people apart from nature observers would venture into this park, although there are reports of illegal hunting of kangaroos and other wildlife and off-road use of motorcycles, ATVs and trail bikes, which could contribute to erosion and threaten dune and vegetation stability. A causeway and boat ramp on Wills Creek Conservation Park enable access for recreational boating and fishing.

Clinton Conservation Park receives considerable local use by fishers and crabbers. To try to rationalise the impact of this type of activity, fencing has been erected at strategic locations. Camping takes place at Port Arthur (not on the park) and boats are launched there at a rudimentary boat launch; there is a roadside rest site here which is owned by the Department of Transport, Energy and Infrastructure (DTEI). Illegal campfires and rubbish dumping occur here, as well as the dumping of garden waste and undesirable activities such as the vandalism of the park boundary fence.

Leven Beach Conservation Park adjoins a Council camping reserve on the eastern boundary. In Council reserves visitors can have dogs, as jurisdiction only goes to high water mark, but the Conservation Park extends to low water mark. When people camp near this Conservation Park they walk their dogs to the west along the beach, where officially no dogs are allowed. Signage has been erected at Leven Beach Conservation Park advising against dog walking and driving on the beach, and this has been enforced.

For the coastal parks, fishing and crabbing in the adjoining intertidal waters are popular pursuits. As some of these parks extend to low water mark, fishing in the intertidal zone might be of concern to park managers, although there are no current issues relating to fishing *per se*. Most park management issues relate to where and by what means the fishers and crabbers access the coast, rather than the fishing itself.

Beach fishing will be permitted (subject to existing and future regulation) in the waters off Bird Islands, Clinton, Leven Beach, Point Davenport, and Wills Creek Conservation Parks. As the park boundaries do not go beyond low water mark, this complies with current regulations prohibiting the taking of wildlife from within parks. It should be noted that there are already rules and regulations under the *Fisheries Management Act 2007* applying to fishers in the waters near coastal parks.

Park managers should continue to liaise with Primary Industries and Resources South Australia (PIRSA) Fisheries and the DEH marine parks program regarding the management of fishing and crabbing in the waters that are included in these parks. DEH park managers should develop contacts with representatives of both commercial and recreational fishing groups who use the parks.

Visitor Facilities

Currently, given the generally low numbers of visitors, there are no special facilities provided for the public who visit these parks. General camping is not permitted and there are no designated picnic sites. As mentioned previously, given the right conditions, persons could launch boats and land on some of the more accessible islands or mangrove creeks. Priority should be given to outdoor recreation that promotes understanding and enjoyment of the natural, historic and cultural environment and visitors should be encouraged to use the parks with this in mind. Given the casual nature of the recreational activities undertaken by the current visitors, the parks do not require elaborate facilities.

The relatively few people who do visit the parks are of necessity fairly self-sufficient. Given the low visitor use of most parks included in this management plan, and the primary objective of biodiversity conservation, few visitor facilities currently exist and few will be established. Apart from basic signage for interpretive purposes as identified in Clinton and Wills Creek Conservation Parks,

there is no immediate demand or requirement for built facilities and none are planned for the term of this management plan.

Objective

Provide opportunities for passive recreation to enhance the visitor experience while remaining consistent with park values.

Strategies

- Monitor visitor impacts, especially in areas of ecological and cultural sensitivity.
- Control and reduce illegal activities that affect the parks' natural values such as kangaroo shooting, firewood cutting, camping and off-road vehicle use and install explanatory signage to this effect.
- Monitor the occurrence of illegal activities in the Port Arthur roadside rest site in conjunction with DTEI and maintain communication regarding management issues related to the use of this site and its impact on Clinton Conservation Park.
- Establish and maintain liaison with Friends, lessees and other stakeholders including diving, fishing and other specialist user groups, as well as with universities, schools and other who may wish to access and use the parks for outdoor recreation.
- Liaise with both PIRSA Fisheries regarding fisheries management and with DEH marine parks managers regarding any marine parks in adjoining waters.
- Liaise with representatives of commercial and recreational fishing interests to ensure compliance with and their understanding of regulations.
- Manage all parks for self-reliant, low-key visitor activities without the requirement for the development of visitor facilities.

8.3 Commercial Tourism

There has been some expression of interest for commercial tourism in Leven Beach and Clinton Conservation Parks. Kayaking is possible around Bird Islands, Point Davenport, Clinton and Wills Creek. Boat Charters may be possible at Clinton Conservation Park.

In the future, any proposals to lease or license for tourism should be assessed against criteria that give high priority to the protection of the natural values of the park. Proposed activities would need to be agreed to (by DEH park managers) prior to the issue of any lease or licence, to ensure that they are in accord with the principles in this management plan.

All commercial tourism activities allowed should be monitored over time, to ensure compliance with lease and licence conditions and to ensure sustainability and minimal impact on park values.

Objective

Encourage commercial tourism in the parks if it can be demonstrated that there will be minimal impact, it provides an educational component about the biodiversity values of the parks, and is consistent with protecting and maintaining cultural and natural heritage.

Strategies

- Permit commercial tourism ventures that are consistent with the principles of this management plan.
- Inspect any future leased premises/licensed operations at least annually to monitor compliance with conditions, ensuring that operations are consistent with park values.

9 MANAGING RESOURCE USE

9.1 Exploration and Mining

The following parks were proclaimed to provide access for exploration and mining under the *Mining Act 1971*:

- Bird Islands Conservation Park (97%);
- Ramsay Conservation Park (100%);
- Wills Creek Conservation Park (100%).

The following parks were proclaimed to provide access under the *Petroleum Act 2000*:

- Bird Islands Conservation Park (97%);
- Minlacowie Conservation Park (100%);
- Ramsay Conservation Park (100%).

Leven Beach Conservation Park was proclaimed under the *National Parks and Wildlife Act 1972* with existing but no future access under State mining legislation. All exploration and/or mining licenses have since expired, so the park no longer provides access under State mining legislation.

The Minister for Environment and Conservation must approve the issuing of all licences and may impose license conditions that must be conducted accordingly in regards to exploration and mining activities.

For Minlacowie and Ramsay Conservation Parks the proclamations in relation to the *Petroleum Act 2000* are quite detailed as to the requirements that must be met by licence holders who wish to access the areas. At Minlacowie Conservation Park the existing rights include surface and subsurface (ie land that lies below the natural surface of the park) access, with rights of renewal of term until 26 December 2022; after that date, future rights will only be permitted for subsurface resources with no access permitted on the surface of the park. Therefore, sub-surface exploration of the park could be conducted via airborne geophysical surveys or directional drilling methods from outside the park. At Ramsay Conservation Park exploration rights are restricted to low level surface exploration (eg foot trafficking) and subsurface access.

It is a requirement of an approval to carry out exploration activities under the *Mining Act 1971* that a Declaration of Environmental Factors (DEF) is submitted as part of an exploration work approval application for activities in sensitive areas. For mining activities, companies submit a Mining and Rehabilitation Plan (MARF) as part of their licence application, which identifies environmental impacts and proposed management techniques.

Under the *Petroleum Act 2000* activities may only be undertaken if there is an approved Statement of Environmental Objectives (SEO). This establishes objectives for management of environmental impacts, risk mitigation and rehabilitation capacity, and assessment criteria for measuring the achievement of these objectives.

The following conditions may form part of licence and activity approvals applied to exploration and mining activities in Bird Islands, Minlacowie, Ramsay and Wills Creek Conservation Parks, but may not be restricted to:

- all mineral exploration activities will require a DEF;
- all petroleum activities require a park specific SEO;
- Notice of Entry must be provided to DEH's Senior Environmental Officer - Mining at least 21 days prior to commencement of activities. Contact must be made at least ten working days prior to commencement of activities, and maintained with the park manager or delegate throughout the work program;
- operators must be aware of their obligations under the *National Parks and Wildlife Act 1972* and the *Environment Protection and Biodiversity Conservation Act 1999*.
- exploration techniques must be utilised in a manner that minimises impacts on the natural and cultural values of the reserves, and specifically, licensees are to avoid any exploratory activity that will be detrimental to local populations of flora and fauna, in particular destruction of

- vegetation that is important refuge for fauna. Where licences cover areas considered sensitive to exploration and mining activity, conditions of use over and above general park provision may be specified. In this case, close liaison is to be maintained with the park manager if any activity is approved in these environments and operators are required to comply with special directions given for ameliorating any impacts.
- operators must comply with additional recommendations made by DEH in relation to carrying out their activities; and
- progressive rehabilitation of any disturbance associated with works will be required, with rehabilitation activities to be completed within six months of the cessation of activities.

Areas of environmental sensitivity that contain high conservation value and should not receive undue disturbance may be identified for higher-level conditions in the licence or works approvals for exploration and mining activities at Bird Islands, Minlacowie, Ramsay and Wills Creek Conservation Parks. Sensitive environments and/or values in the parks that should not receive undue disturbance include, but are not limited to:

- the nationally listed wetland and associated creeks and salt pans in Wills Creek Conservation Park, which are a significant bird nesting and fish nursery site, and important habitat for many migratory sea birds including those listed under the Japan-Australia and China-Australia Migratory Birds Agreement;
- environmentally significant mangrove and samphire habitat in Bird Islands and Wills Creek Conservation Parks;
- habitat for the nationally and state vulnerable Slender-billed Thornbill (*Acanthiza iredalei*) in Wills Creek Conservation Park;
- a major rookery for many birds and migratory sea birds listed under the Japan-Australia and China-Australia Migratory Birds Agreement in Bird Islands Conservation Park;
- flora of conservation significance which are known to exist within Minlacowie and/or Ramsay Conservation Parks, particularly the Winter Spider-orchid (*Caladenia brumalis*), found in both parks, and the Jumping-jack Wattle (*Acacia enterocarpa*), found in Ramsay Conservation Park, which is the only known National Parks and Wildlife Act reserve on Yorke Peninsula to support this species;
- the rare grassy understorey in Ramsay Conservation Park, which is susceptible to weed invasion as a likely result of disturbance from surface access for exploration;
- the high biodiversity values and rare habitat-types of Minlacowie and Ramsay Conservation Parks.

Cheetham Salt Ltd currently holds mineral leases over portions of, and adjacent to, Wills Creek Conservation Park (Figure 4). This park has been proclaimed to accommodate the existing tenures and future saltfield requirements. Management priorities should target sustainable operation of the saltfield operations by liaising with representatives from Cheetham Salt Ltd, to ensure that the park's natural values, in particular the wetland and associated bird habitats, are protected and conserved, and that mining and exploration activities minimise impacts to these environmentally sensitive areas.

Objective

Ensure that exploration and mining activities at Bird Islands, Minlacowie, Ramsay and Wills Creek Conservation Parks are undertaken in a manner that minimises disturbance, and long-term or irreversible impacts, to the parks' natural values.

Strategies

- Liaise with PIRSA and operators engaged in exploration and mining activities in the parks regarding their conservation values to ensure a minimisation of environmental impacts and to prevent undue disturbance and to ensure compliance with the objectives of this management plan.
- Monitor any mineral or petroleum exploration activities within the parks and ensure that they are in accordance with the objectives of this management plan.
- Liaise with representatives from Cheetham Salt Ltd to ensure future expansions do not have a negative impact on park values.

9.2 Leases and Licences

There is a licence for a wind anemometer that relays signals to assist local boat-owners, located at a site on the mainland portion of Bird Islands Conservation Park. This licence was issued to the Commonwealth Bureau of Meteorology in 2003 with a five year right of renewal. There is one shack remaining at Sandy Point with a life tenancy to a retired fisherman at Point Davenport Conservation Park. It is occupied under a leasing arrangement between DEH and the tenant.

Objective

Ensure that leases and licences have minimal impact on park values.

Strategy

- Maintain liaison with the lessees to ensure the tenant requirements and park management objectives are met.

10 MANAGING RESERVE TENURE

10.1 Public Utilities

Currently there is little in the way of telecommunication towers, powerlines, water pipelines, or marine navigation aids to be found on the parks included in this management plan. Infrastructure supplying electricity, telecommunications, and mains water tends to be located on the roads around park boundaries or on adjacent areas.

Bird Islands and Clinton Conservation Parks are the only parks in this management plan that contain public utilities. A wind anemometer is located in Bird Islands Conservation Park. A powerline easement crosses the northern section of Clinton Conservation Park. Although visually intrusive, the power pylons pose no known threat to park values and utility service contractors only require periodic access for inspection and routine maintenance. There is a water meter located near the former railway easement that may indicate the presence of underground pipelines near the park boundary. This, however, will be removed.

DEH is opposed to the location of utilities on reserves except under special conditions. Protection of reserve values should be the priority and reserves should not be taken as the 'easy option' for public utility sites because they are public land and (usually) remote from residential areas. Considering the relatively small size of the parks included in this management plan and the primarily conservation-focused objectives, public utilities should not be installed in the parks (except for those already existing in Bird Islands and Clinton Conservation Parks). Instead, alternative sites should be sought.

Objective

Ensure that the management of public utilities is compatible with the conservation of park values.

Strategies

- Liaise with ETSA and the Bureau of Meteorology to ensure maintenance and use of public utilities at Bird Islands and Clinton Conservation Parks is compliant with the natural values of the parks.
- Manage and respond to any future proposals for the location of public utilities within the parks in accordance with current DEH policy and the provisions of this management plan.

11 INVOLVING THE COMMUNITY

Friends and Volunteers

Volunteer support and community-based involvement that conserves and improves biodiversity and cultural values, and establishes quality management of recreational use, has become an essential component of park management. The Department for Environment and Heritage acknowledges and supports the active volunteer contribution of the Port Clinton and Price Progress Association towards the management of Clinton Conservation Park. It is important for DEH to continue communication with Friends members, provide support and assistance, including legal and policy advice, technical, planning and management direction. The Friends of Troubridge Island Conservation Park group has recently expanded to include other Yorke regional parks and is now the Friends of Troubridge Island and Yorke District Outer Parks. DEH will continue to encourage and support any works conducted in the parks in this management plan.

Regional Communities and Park Neighbours

DEH supports and promotes partnerships and cooperative management arrangements to ensure integrated natural resource management. This requires the development of effective working relationships with government agencies, local authorities, non-government organisations and the local community.

These nine parks are of high conservation value and to ensure the long-term protection of their assets, the broader community needs to be involved in their management. Linking conservation programs taking place on the parks with those running elsewhere in the region is important for the long-term viability of native species of plants and animals. For this to succeed, community awareness and support is essential. Where at all possible, linkages should be maintained or developed to tap into alternative funding sources (eg NRM programs). DEH staff should forge management links with the District Council of Yorke Peninsula and local councils, Narungga (and Kurna) stakeholders and key community stakeholders. Park managers should also liaise with the various land management authorities linked to the Northern and Yorke NRM Board, as well as with any park lessees/licensees and the owners and managers of nearby land. The Northern and Yorke Consultative Committee will continue to play an active role in advising on the parks.

Objective

Develop and encourage community support for the management of the parks of Yorke Peninsula.

Strategies

- Encourage Friends Groups and other volunteers in making a voluntary contribution to park management.
- Encourage and facilitate the involvement of local schools and universities and other institutions in research and volunteer programs.
- Liaise with relevant agencies, regional authorities, stakeholders, lessees and neighbours with interests in the parks in order to promote and maintain the parks' natural values.
- Involve representative Aboriginal traditional owners in the management of the parks and in the preservation of their cultural heritage.

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APPENDIX A: PROPERTY DESCRIPTIONS

Conservation Park	Plan	Parcel	Hundred	Area (hectares)
Bird Islands	H840200	S794	Wallaroo	8.63
	H840200	S795	Wallaroo	1.36
	D31581	A1	-	5.69
	D31581	A2	-	1.8
	D35082	A50	-	340.23
Carribie	H130100	S153	Carribie	19.44
Clinton	H210300	S568	Clinton	369.2
	H210300	S586	Clinton	79.05
	H210300	S587	Clinton	448.75
	H210300	S588	Clinton	138.43
	H210300	S589	Clinton	781.98
	H140600	S446	Inkerman	98.52
	H210300	S622	Clinton	1.42
Leven Beach	H210300	S623	Clinton	4.41
	H131300	S161	Para Wurlie	148.26
	H131300	S162	Para Wurlie	173.98
Leven Beach	H131300	S452	Para Wurlie	148.16
Minlacowie	D27081	A500	Minlacowie	28.46
Point Davenport	H130200	S36	Coonarie	39.75
	H130200	S46	Coonarie	1.86
	H130200	S47	Coonarie	1.80
	H130200	S48	Coonarie	1.89
	H130200	S49	Coonarie	1.50
	H130200	S50	Coonarie	1.61
	H130200	S51	Coonarie	2.09
	H130200	S52	Coonarie	1.47
	H130200	S53	Coonarie	1.61
	H130200	S54	Coonarie	0.89
	H130200	S55	Coonarie	1.28
	H130200	S56	Coonarie	1.56
	H130200	S57	Coonarie	1.33
	H130200	S58	Coonarie	0.84
	H130200	S59	Coonarie	0.97
	H130200	S60	Coonarie	0.83
	H130200	S61	Coonarie	1.36
	H130200	S62	Coonarie	1.07
	H130200	S103	Coonarie	33.62
	H130200	S104	Coonarie	28.99
	H130200	S105	Coonarie	6.22
	H130200	S156	Coonarie	37.92
	H130200	S157	Coonarie	35.68
	H130200	S252	Coonarie	1.30
	H130200	S255	Coonarie	40.45
Ramsay	D72948	A10	Ramsay	145.27
Warrenben	H131500	S44	Warrenben	384.69
	H131500	S45	Warrenben	1380.06
	H131500	S54	Warrenben	1255.24
	H131500	S97	Warrenben	1037.53
Wills Creek	D31429	A11	Clinton	32.57
	D31429	A12	Clinton	61.12
	D31429	A13	Clinton	117.13
	D31429	A14	Clinton	10.71
	D31429	A20	Clinton	4.56
	D31429	A21	Clinton	385.41
	D31429	A22	Clinton	685.72
	D31429	A26	Clinton	76.18
	D31429	A27	Clinton	309.58
	D31429	A28	Clinton	39.02
	D44470	A6	Cunningham	583.60

APPENDIX B: CONSERVATION STATUS CODES

Australian Conservation Status Codes

The following codes are based on the current listing of species under Section 179 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

- EX** **Extinct:** there is no reasonable doubt that the last member of the species has died.
- EW** **Extinct in the Wild:** known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CE** **Critically Endangered:** facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- E** **Endangered:** facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- V** **Vulnerable:** facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
- CD** **Conservation Dependent:** the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

Note: Prescribed criteria as defined under the IUCN Red List of Threatened Species.

South Australian Conservation Status Codes

The following codes are based on the current listing of species under Schedules of the *National Parks and Wildlife Act 1972*, as amended in 2008. To align with other States, Territories and the Commonwealth (EPBC Act) listing categories and ratings, the IUCN criteria were used as a basis for determining threatened species status under the *National Parks and Wildlife Act 1972*. For IUCN criteria see:

IUCN (2008) *IUCN Red List Categories*. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland (www.redlist.org).

IUCN (2001) *IUCN Red List Categories and Criteria: Version 3.1*. IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, United Kingdom (www.redlist.org).

- E** **Endangered:** (Schedule 7) in danger of becoming extinct in the wild.
- V** **Vulnerable:** (Schedule 8) at risk from potential or long term threats which could cause the species to become endangered in the future.
- R** **Rare:** (Schedule 9) low overall frequency of occurrence (may be locally common with a very restricted distribution or may be scattered sparsely over a wider area). Not currently exposed to significant threats, but warrants monitoring and protective measures to prevent reduction of population sizes.

Regional Status Codes

The categories below apply to the species distribution at a regional level. There are no regional conservation status categories developed for mammals, reptiles or amphibians to date.

Birds

Regional conservation status for birds follow:

Carpenter and Reid (1998) *The Status of Native Birds in the Agricultural Areas of South Australia*. Unpublished and regularly updated database.

The regions are defined as follows:

ML	Mount Lofty	MN	Mid-North	SE	South-Eastern	KI	Kangaroo Island
MM	Murray Mallee	EP	Eyre Peninsula	YP	Yorke Peninsula		

Plants

Regional conservation ratings for plants follow:

Lang, PJ and Kraehenbuehl, DN (2001) *Plants of Particular Conservation Significance in South Australia's Agricultural Regions*.

Department for Environment and Heritage (undated) *Florlist*. Unpublished and regularly updated database.

The regions are as defined by the State Herbarium (Plant Biodiversity Centre), illustrated in the front cover of:

Barker, WR, Barker, RM, Jessop, JP and Vonow, HP (Eds) (2005) *Census of South Australian Vascular Plants. Fifth Edition. J. Adelaide Bot. Gard. Supplement 1*. Botanic Gardens of Adelaide and State Herbarium, Adelaide.

NW	North-Western	FR	Flinders Ranges	NL	Northern Lofty	SL	Southern Lofty
LE	Lake Eyre	EA	Eastern	MU	Murray	KI	Kangaroo Island
NU	Nullarbor	EP	Eyre Peninsula	YP	Yorke Peninsula	SE	South-Eastern
GT	Gairdner-Torrens						

In order of decreasing conservation significance:

- X Extinct/Presumed extinct:** not located despite thorough searching of all known and likely habitats; known to have been eliminated by the loss of localised population(s); or not recorded for more than 50 years from an area where substantial habitat modification has occurred.
- E Endangered:** rare and in danger of becoming extinct in the wild.
- T Threatened:** (*Plants only*) likely to be either Endangered or Vulnerable but insufficient data available for more precise assessment.
- V Vulnerable:** rare and at risk from potential threats or long term threats that could cause the species to become endangered in the future.
- K Uncertain:** likely to be either Threatened or Rare but insufficient data available for a more precise assessment.
- R Rare:** has a low overall frequency of occurrence (may be locally common with a very restricted distribution or may be scattered sparsely over a wider area). Not currently exposed to significant or widespread threats, but warrants monitoring and protective measures to prevent reduction of population sizes.
- U Uncommon:** less common species of interest but not rare enough to warrant special protective measures.
- Q Not yet assessed:** but flagged as being of possible significance.
- N Not of particular significance:** (*Plants only*) also indicated by a blank entry.
- C Common:** (*Birds only*) also indicated by a blank entry.
- O Occasional Visitor Only:** (*Birds only*) not considered of conservation status